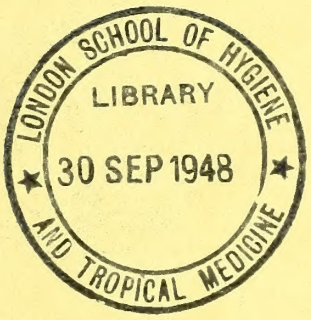


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ROYAL COMMISSION ON TUBERCULOSIS (HUMAN AND ANIMAL)

SECOND INTERIM REPORT

OF THE

ROYAL COMMISSION

APPOINTED TO INQUIRE INTO THE RELATIONS OF

HUMAN AND ANIMAL TUBERCULOSIS.

PART II. APPENDIX.

VOLUME II. (PAGES 617-1217.)

THE PATHOGENIC EFFECTS OF HUMAN VIRUSES.

BY

DR. L. COBBETT.

Presented to both Houses of Parliament by Command of His Majesty.



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34725



VIRUS H 28. "C.L."

CERVICAL GLANDS. (Operation.)

77.—II.—Sec. 2. 1250—Wt. 13670. 10/07. Wy. & S. 3643r.



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TABLE 28.

VIRUS H 28. "C.L."

May 12, 1904.

GUINEA-PIGS.

1,270	Killed	48 days	G.T.
1,271	Died	48 „	G.T.

June 29, 1904.

E. of lesions | G.P's 1270–1271.

RABBITS.

102	Died	21 days	G.T.	
103	„	14 „	G.T.	V.



COW-CALF 513.

Subcutaneous.
Dose : 901,466,000 T.B.
Died, July 24, 1904.
25 days.
P.M.—General tuberculosis, severe.

GUINEA-PIG.

E. of Prescapular Gland.	1,340	Died	10 days	Tuberculous peritonitis very acute.
	1,341	„	13 „	



COW-CALF 515.

Subcutaneous.
Dose : 901,466,000 T.B.
Killed, when dying, August 12, 1904.
44 days.
P.M.—General tuberculosis, severe.

E. of Prepectoral and deep Cervical Glands.



COW 143.

Intramammary.
Dose : 40,000,000 T.B.
Killed, when dying, September 20, 1904.
38 days.
P.M.—Great enlargement and infiltration with caseous tubercles, of injected quarters and supramammary glands. Both iliac and precrural glands contain tubercles. Some minute tubercles in lungs.

RABBITS.

123	Died	41 days	G.T.	
124	„	23 „	G.T.	V.

RATS.

24	D. 340 days	Visible lesions in lungs ; T.B. in organs.	
25	D. 592 „	Death from causes other than tuberculosis.	S.

GOAT 23.

Subcutaneous.
Dose : 5,000,000 T.B.
Died, November 16, 1904.
96 days.
P.M.—General tuberculosis.

September 14, 1904.

MONKEY 63.

Fed once with 90 c.c. of milk of Cow 143, containing 5,000,000 T.B.
Died, December 11, 1904.
88 days.
P.M.—General tuberculosis. (Cervical glands only slightly affected. Small intestine extensively ulcerated ; a group of small ulcers also in large intestine. Mesenteric glands form a large caseating mass.)

MONKEY 65.

Fed once with 90 c.c. of milk, containing 5,000,000 T.B.
Died, December 3, 1904.
80 days.
P.M.—General tuberculosis. (Cervical glands normal. A number of ulcers in small intestine. Mesenteric glands much enlarged and caseating.)

TABLE 28a.

VIRUS H 28. "C.L."

CULTURE INOCULATIONS.

[1] September 9, 1904.

Strain derived from human cervical glands, direct.
Total duration of artificial cultivation, 4 months.
Sub-culture used for injection; 21 days old, on pure serum.



BULL-CALF 469.

Subcutaneous.
DOSE: 43 milligrammes.
Killed: October 8, 1904, when very ill. 29 days.
P.M.—General tuberculosis, severe.

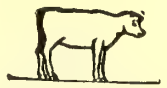


BULL-CALF 489

Subcutaneous.
DOSE: 50 milligrammes.
Killed: October 7, 1904, when dying. 28 days.
P.M.—General tuberculosis, severe.

[2] June 8, 1905.

Strain as above.
Total duration of artificial cultivation, 13 months.
14th sub-culture on pure serum used for injection, 20 days old.



BULL-CALF 813.

Subcutaneous.
DOSE: 10 milligrammes.
Died: July 17, 1905. 39 days.
General tuberculosis, severe.



BULL-CALF 815.

Subcutaneous.
DOSE: 10 milligrammes.
Killed when dying, July 26, 1905. 48 days.
General tuberculosis, severe.

RABBITS.

456	10 mg.	Died 36 days	G.T.
457	1· „	„ 40 „	„
458	0·1 „	„ 40 „	„
459	0·01 „	„ 5 „	No Tuberculosis.

GUINEA-PIGS.

1562	1· mg.	Died 13 days	G.T.
1563	1· „	„ 16 „	„
1560	0·1 „	„ 24 „	„
1561	0·1 „	„ 31 „	„

RAT.

39	100 mg.	Died 33 days	General dissemination of T.B.

VIRUS H 28. "C.L."

C.L., a Male Child aged one year and two months, admitted to Hospital on May 9th, 1904, suffering from Enlarged and Suppurating Cervical Glands. Operation I.: May 12th, 1904. Operation II.: August 17th, 1905.

Family History.—There was a history of phthisis on the mother's side, her father having suffered from consumption. The mother herself before marriage suffered from cough and occasional hæmoptysis.

Clinical History.—The previous history of the child was somewhat indefinite. He had always been artificially fed from birth.

On admission swellings were found on both sides of the neck and in the left groin. It was stated that all these swellings had been present for the past five months. The neck was becoming painful.

Two glands on the right side of the neck were excised on May 12th, and found to be breaking down. The wound had healed when the child was discharged from hospital.

Subsequent History of Patient.

The child was seen again on October 1st, 1904. The wound on the right side of the neck had quite healed. The child looked anaemic and unhealthy. On the left side of the neck were some enlarged glands, and small swellings could also be detected in both axillæ and in both groins. There also appeared to be an indistinct tumour or swelling in the region of the umbilicus.

The mother stated that the child suffered from constant diarrhœa and occasional vomiting, and was not so well as when he left the hospital. She also stated that he suffered occasionally from choking fits, which were relieved by coughing up blood. The hæmorrhage, however, appeared to be due to some ulcers in the mouth which caused the mucus at times to appear blood-stained.

On November 23rd, 1904, the child was again seen. He had then considerably improved since the last visit, six weeks previously, looked more healthy, and had evidently put on flesh. The wound on the right side of the neck was quite sound, but the glands on the left side were still enlarged. The glands in the axillæ and groins could still be detected, but no umbilical tumour could be felt.

The mother stated that the child took food well, that it occasionally had diarrhœa, but not so frequently as before, and that there was still occasional blood-stained expectoration.

On July 31st, 1905, the child was again seen. He was distinctly better in every way, and appeared well nourished, but the glands on the left side of the neck had increased in size, and a chain of smaller glands could be felt in connection with the large ones. The inguinal glands had also become larger. There was a small ulcer on the right cornea.

In August, 1905, the child was re-admitted to hospital, and some glands from the left side of the neck were removed by operation.

DESCRIPTION OF MATERIAL RECEIVED AT BLYTHWOOD.

(a) *First Operation, May 12th*, 1904.

Three Cervical Glands.—Each was about the size of a rather small gooseberry, consisting of partly caseous and partly gelatinous tissue. Two of the glands had cavities in the interior, containing turbid fluid.

On microscopic examination a few short tubercle bacilli were found in the caseous matter, but they were not present in large numbers.

(b) *Second Operation, August 17th*, 1905.

Two Enlarged Cervical Glands.—These were bigger than those removed at the first operation, and contained softened caseous matter.

Note.—An emulsion was made from these glands, and guinea-pigs were inoculated with the fresh material. They, however, did not become infected. Cultures were also sown from the glands, but they unfortunately failed. (*See* "Tables of Origins," page 7.)

VIRUS H 28. "C.L.

CERVICAL GLANDS.

CULTURE INOCULATIONS—*continued.*

(3.) August 30, 1905.

Experiment to determine whether long-continued cultivation on a glycerin-medium diminishes the virulence for calves and rabbits of a virus of Group I.

Strain derived from human cervical glands, through Rabbit 102.

Total duration of artificial cultivation : 14 months.

Two series of cultures were used, one of which has been cultivated on glycerin-serum, the other, which served as a control, for the same length of time on pure serum.

The subcultures used for inoculation were in each case 21 days old, on pure serum.

Pure Serum Series (controls).



BULL-CALF 863.
Subcutaneous.
Dose : 10 mg.
Killed when well,
November 28, 1905.
90 days.

On the surface of the lung
rous tubercles of various
es were fairly numerous.
he spleen was moderately
fected ; the liver and kid-
ys very slightly. Almost all
e glands contained caseous
bercles. (G.T. slight.)



BULL-CALF 877.
Subcutaneous.
Dose : 10 mg.
Killed when dying,
October 6, 1905.
37 days.

General tuberculosis, severe.
[Death was perhaps hastened
by obstruction of ureters by
calculi.]

RABBITS.

559	10 mg.	Died, 16 days	G.T.
560	1· „	„ 23 „	„
561	1· „	„ 23 „	„
562	0·1 „	„ 31 „	„

GUINEA-PIGS.

1687	1· mg.	Died 27 days*	G.T.
1688	1· „	„ 13 „	„
1689	0·1 „	„ 24 „	„
1690	0·1 „	„ 17 „	„

* Injection partly subcutaneous.

Glycerin-serum Series.



BULL-CALF 819.
Subcutaneous.
Dose : 10 mg.
Died, October 21, 1905.
52 days.
General tuberculosis, severe.



BULL-CALF 875.
Subcutaneous.
Dose : 10 mg.
Killed when well,
November 29, 1905.
91 days.

A few minute tubercles in
lungs and spleen. Thoracic,
renal, and lumbar glands con-
tained fairly numerous caseous
foci.

RABBITS.

563	10· mg.	Died, 12 days	Acute G.T.
564	1· „	„ 24 „	G.T.
565	1· „	„ 20 „	„
566	0·1 „	„ 29 „	„

GUINEA-PIGS.

1691	1· mg.	Died, 14 days	G.T.
1692	1· „	„ 9	„
1693	0·1 „	„ 18	„
1694	0·1 „	„ 20	„

COW-CALF 513. (Virus H 28. "C.L.")

Subcutaneous Inoculation of emulsion of lesions from Guinea-pigs 1270–1271.

Dose—901,466,660 tubercle bacilli. [Vol.: 20 cc. E. = 45,073,333 tubercle bacilli per cc.]

Date—June 29th, 1904.

Weight at Inoculation—1 cwt. 1 qr. 5 lbs. [Age about 13 weeks.]

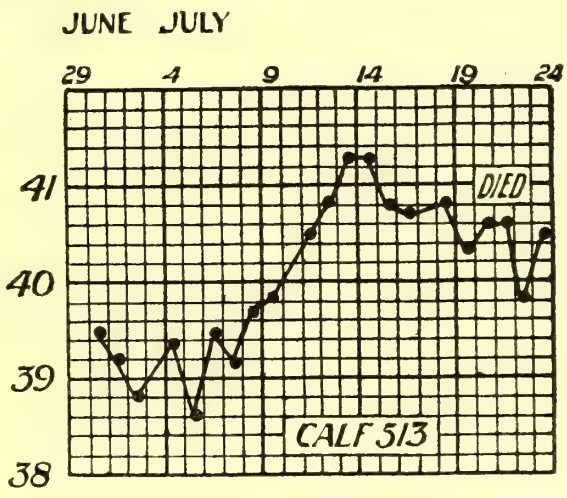
Died—July 24th, 1904. [25 days after inoculation.]

Clinical Notes.

The calf was inoculated on June 29th, 1904. Nine days later there was a swelling at the seat of inoculation measuring 4½ in. by 3 in. The right prescapular gland was enlarged, 3¼ in. in length.

On July 13th, a fortnight after inoculation, the tumour measured 6½ in. by 4¼ in., and the gland was 4 in. long. The temperature was very high, and the animal was losing weight. On July 24th, 25 days after inoculation, the calf was dead. It had been steadily getting worse since 13th, and for 3 days previous to death its respiration had been exceedingly laboured, and it had generally been seen lying on the ground with head outstretched.

Temperature.



Weights.

The calf lost weight rapidly from the very commencement of the experiment.

	cwt.	qrs.	lbs.	
June 29th, 1904 - - -	1	1	5	Inoculated.
July 5th, 1904 - - -	1	1	0	
July 19th, 1904 - - -	1	0	4	
July 24th, 1904 - - -	0	3	19	Died.

Total loss of weight during experiment.—1 qr. 14 lbs.

Average rate of loss per week.—11·7 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Very thin.

Local Lesion.—The tumour at the seat of inoculation was firmly adherent to skin, and slightly infiltrated both it and the subjacent muscle. It weighed 10 ozs., and measured 5¼ in. by 3¾ in. by 1½ in. It was flat on its deeper surface, and convex on its superficial.

On section it was firm, creamy pink in colour, or streaked with fine pink lines, composed of necrotic tissue, and contained towards its exterior end a cavity with ragged walls, which measured 1⅜ in. by 1 in., and was filled with a thin fluid which contained tissue débris. Further section revealed another small cavity which contained softened caseous material.

Right Prescapular Gland.—Was surrounded by a small amount of yellow gelatinous œdema, and was not adherent to neighbouring structures. It weighed 4 ozs., and measured 4 in. by 1¾ in. by 1¾ in. Section showed it to be yellowish and caseous throughout, except for a small triangular area in the centre of the gland, where the normal gland tissue remained, and was speckled with pinhead yellow caseous points.

Left Prescapular Gland.—Normal.

Prepectoral Glands.—The larger right prepectoral gland was normal in size and appearance; the smaller was of normal size, but contained one or two minute tubercles.

Pectoral Glands.—The right pectoral gland was a little larger than normal, but no tuberculous foci could be seen in it.

Axillary Glands.—Normal in size; one or two small foci were seen on section.

Thorax.

Pleura.—The visceral layer was thickened.

Lungs.—Were solid, heavy, and weighed together 6 lbs. 10 ozs. The basal lobes and a large part of the right apical lobe did not collapse. Small portions just floated in water. The remainder of the lung tissue was dark in colour and congested. The whole surface of both lungs was very thickly peppered with very small grey translucent tubercles, and so numerous were these that it would have been difficult to place the point of a pencil wholly on normal lung tissue.

On section the surface was granular, due to the projection of these very minute tubercles. The lung fringes were apparently normal.

Trachea.—The trachea and bronchi contained a frothy fluid.

Thoracic Glands.—The left bronchial was large, and measured 1¾ in. by 1⅜ in. by 1 in. It contained many large irregular caseous nodules, very little normal gland tissue being left. The right bronchial was apparently normal.

Peribronchial glands normal.

Of the glands in the posterior mediastinum the large post-mediastinal gland measured 4 in. by 1¾ in. by ¾ in. It was œdematous, and contained large irregular caseous

foci. The cortex was prominent and white. Of the remainder, five were similar in appearance to the large gland just described, while two others were apparently normal in size, but contained a few small tubercles.

Heart.—Was apparently normal, except for one small tubercle (?) in the right ventricle.

Abdomen.

Peritoneum, Omentum.—Normal.

Pancreas.—Normal.

Intestines.—Normal.

Mesenteric Glands.—Contained two minute doubtful specks.

Spleen.—Weighed 10 ozs. It was throughout thickly set with grey translucent tubercles similar in size and appearance to those seen in the lung.

Liver.—Weighed 4 lb. 2 ozs. The surface was thickly speckled with small white tubercles beneath the capsule. On section the substance of the organ was seen to be infiltrated to an equal degree with small tubercles, which projected above the surface, thus giving the section a granular appearance.

Hepatic Glands.—Two in number, were enlarged, and contained large caseous nodules.

Kidneys.—Weighed 8 ozs. each. They were uniformly speckled with small white tubercles. (These specks were smaller than those seen on the surface and in the substance of the liver). Section showed similar tubercles scattered throughout the cortex and medulla.

Suprarenals.—Apparently normal.

Renal Glands.—Apparently normal.

Coeliac Glands.—Five in number. They were apparently not enlarged, but all contained a number of fairly large grey tubercles.

Lumbar Glands.—One was apparently normal; another contained some very small translucent tubercles.

Iliac Glands.—Were somewhat enlarged, and contained a large number of grey tubercles.

Special Glands.

Precrural.—The left precrural contained a few small translucent tubercles. The right was apparently normal.

Gluteal.—The right contained a few small tubercles. The left was somewhat congested.

Right Ischiatic Gland.—Was a little enlarged.

Left Ischiatic Gland.—Normal in size and appearance.

Popliteal.—Both were enlarged, and contained a few tubercles.

Submaxillary.—Both right and left contained some small tubercles.

Parotideal.—Both were found to contain a few tubercles.

Some hæmo-lymph glands in the neighbourhood of the parotideal glands contained many tubercular foci.

Post-Pharyngeal.—Congested, enlarged and œdematous.

Hyoid.—Both contained small tubercles.

Tongue, Palate, Tonsils, Pharynx.—Normal.

Joints.—The joints of the extremities were examined and found to be healthy.

Microscopical Examination.

Emulsion of Prescapular Gland.—Very rich in tubercle bacilli, relatively short.

Coeliac Gland.—Tubercle bacilli, very few seen.

Pectoral Gland.—Tubercle bacilli, few.

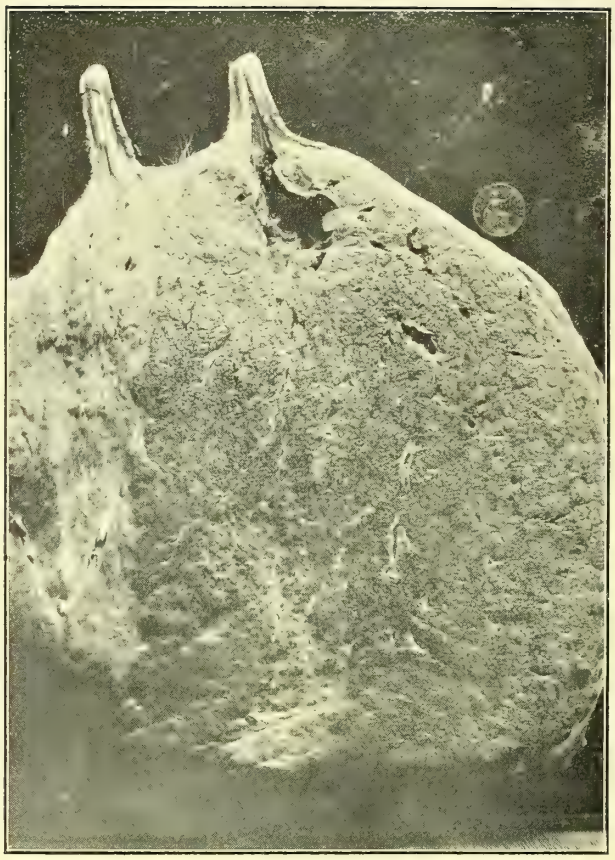
Axillary Gland.—Tubercle bacilli, fairly numerous.

Right Prepectoral Gland (large) } No tubercle bacilli.
Right Prepectoral Gland (small) }

Right Bronchial Gland.—Tubercle bacilli, numerous.

Mesenteric Gland.—Tubercle bacilli.

Heart (tubercle from).—Tubercle bacilli, two seen.



COW 143. Intramammary. Virus H 28. "C.L."

Section of udder, showing inoculated quarter [on the right] composed almost entirely of caseating tubercles, and uninoculated quarter [on the left] apparently atrophied, but free from tubercle. (*See* page 626.)



CALF 515. Subcutaneous. Virus H 28. "C.L."

Tumour at seat of inoculation, cut open. (*See* page 624.)

(*To face page 624.*)

COW-CALF 515. (Virus H. 28. "C.L.")

Subcutaneous Inoculation of emulsion of lesions from Guinea-pigs 1270–1271.

Dose—901,466,660 tubercle bacilli. [Vol. : 20 cc. E. = 45,073,333 tubercle bacilli per cc.]

Date—June 29th, 1904.

Weight at Inoculation—1 cwt. 0 qrs. 0 lbs. [Age about 9 weeks.]

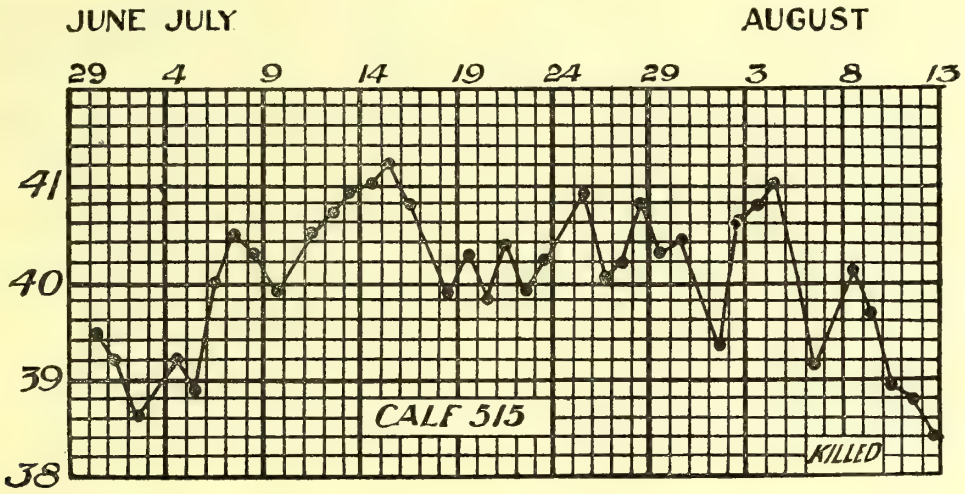
Killed—When dying, August 12th, 1904. [44 days after inoculation.]

Clinical Notes.

The calf was inoculated on June 29th, 1904.

Nine days later there was a swelling at the seat of inoculation measuring 4½ in. by 3 in. The right prescapular gland was enlarged, 2¼ in. long. On July 13th, a fortnight after inoculation, the tumour was hard and prominent, measuring 6 in. by 4¼ in., and the gland was 3¼ in. long. The temperature was very high (41·0°C.). The animal appeared ill and thin. It gradually got worse, the respiration becoming laboured; and on August 12th, 44 days after inoculation, it was killed when in a dying condition.

Temperature.



Weights.

The calf lost weight from the commencement, but the loss was not nearly so great as in the case of the fellow Calf 513.

	cwt.	qrs.	lbs.	
June 29th, 1904	1	0	0	Inoculated.
July 5th, 1904	0	3	23	
July 19th, 1904	0	3	15	
August 2nd, 1904	0	3	17	
August 12th, 1904	0	3	15	Killed when dying.

Total loss of weight during experiment.—13 lbs.

Average rate of loss per week.—2 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Thin.

Local Lesion:—The tumour at the seat of inoculation measured 6½ in. by 5½ in. by 2½ in., and weighed 1 lb. 4 ozs. There was much œdema around and below. The skin over it was cracked and ulcerated. On section there was a cavity the size of a small egg, which had not yet been opened, containing caseous masses and lined by similar tissue. The rest of the tumour was formed of solid caseating or necrotic tissue of a uniform yellowish-pink colour, intimately infiltrating skin and subjacent muscle.

Right Prescapular Gland.—Measured 3¾ in by 1¾ in. by 2 in. On section it was dense and firm, composed of a uniform salmon-pink tissue, speckled in parts with little red points.

Left Prescapular Gland.—Contained a few caseous foci.

Right Prepectoral Gland.—The size of a blackbird's egg. It consisted principally of a dense uniform cream-coloured necrotic tissue with a red spot in the centre, surrounded by a narrow zone of darker translucent pink tissue containing caseous foci, and outside this again a thickened capsule.

Left Prepectoral Gland.—Two in number, one being slightly enlarged. One focus was seen in each.

Pectoral Glands.—The large right pectoral gland contained groups of caseous foci.

Axillary Glands.—Right axillary gland contained a single focus. Left axillary gland contained three or four foci, larger than that in the right.

Cervical Glands.—The right deep cervical glands were six in number. The largest, close to the prepectoral gland, but lying on the carotid vessels, was almost as large as a blackbird's egg. It was similar on section to the right prepectoral gland. The other glands extended along the sheath of the vessels as far as the angle of the jaw. They were caseous throughout, or packed with caseous foci.

Three deep cervical glands on the left side contained caseous foci.

A hæmo-lymph gland close to the left prescapular gland contained a caseous focus.

Thorax.

Pleura.—Normal.

**Lungs.*—The lungs were heavy. The anterior and inferior half of each lung was a deep red in colour, and almost completely consolidated. The right anterior lobe and portions of the other smaller lobes were entirely airless, while elsewhere the consolidated tissue was speckled here and there with lobules which still contained air.

* *See* Plate 5.

The posterior and dorsal portions of the lung were paler, being speckled with little irregular dark areas of consolidation surrounding the tubercles, and here and there containing a wedge-shaped dark solid area.

The whole of the lungs contained very numerous small grey tubercles about the size of a pin's head, rather more thickly scattered throughout the anterior portions than elsewhere.

Thoracic Glands.—Just within the thorax, on the ventral side of the trachea, was a gland the size of a bantam's egg. The other thoracic glands were enlarged, and the cortices of all were in an early stage of caseation.

Pericardium, Heart.—Normal.

Abdomen.

Peritoneum, Omentum.—The omentum showed considerable hypertrophy of the villous tufts, and here and there a small tubercle.

Intestines.—Normal.

Glands of the Rumen.—Contained tubercles.

Mesenteric Glands.—All the mesenteric glands contained caseating nodules and foci.

Spleen.—The spleen was large. The tubercles within it raised the surface here and there into nodules, which were most conspicuous near the margin. At one point was a pedunculated tubercle the size of a split pea. Section showed the organ packed with yellowish tubercles, rather larger and less regular in shape than usual.

Liver.—Showed from twelve to eighteen pearly grey tubercles, slightly raised on the surface, with overlapping margins. In addition to this, the whole surface was peppered as thickly as possible with minute pale points of varying grades of visibility, according to their depth beneath the capsule. Section showed them scattered throughout the organ.

Hepatic Glands.—Were moderately enlarged, and on section similar to the thoracic.

Kidneys.—The kidneys showed a considerable number of small tubercles on their surfaces, the largest about $\frac{1}{8}$in. in diameter. Others, more deeply seated, were barely visible. About fifty were counted on the surface of the right kidney, which was the more affected of the two. Section showed the tubercles scattered sparsely throughout the cortex.

Suprarenals.—Left contained a doubtful focus. In the right were several small tubercles.

Renal Glands, Iliac Glands.—Contained numerous tuberculous foci.

Genito-Urinary System.

Uterus, Ovaries.—Normal.

Special Glands.

Precrural., *Ischiatic.*—Contained numerous tuberculous foci.

Gluteal.—Contained tuberculous foci, but they were not so numerous as in the precrural glands.

A gluteal hæmo-lymph gland contained tuberculous foci.

Popliteal.—Contained numerous tuberculous foci.

Submaxillary, Parotideal, Pharyngeal.—Contained numerous rather large tubercles.

Hyoid.—Contained tuberculous nodules.

No lymphatic glands were found which did not contain tubercles.

Tongue, Palate, Tonsils, Pharynx.—Normal.

Microscopical Examination.

Emulsion of Prescapular Gland.—Tubercle bacilli.

Emulsion of Prepectoral and Right Deep Cervical Glands.—Tubercle bacilli more numerous.

Hæmolymph Gland from Left Prescapular Region.—Tubercle bacilli.

Right Suprarenal.—Tubercle bacilli.

Bone Marrow.—No tubercle bacilli.

The bacilli were short and straight.

COW 143. (Virus H 28. "C.L.")

Intramammary Inoculation of Emulsion of prepectoral and deep cervical glands from Calf 515.

Dose—20,000,000 tubercle bacilli into each of two quarters (40,000,000 tubercle bacilli in all. [Vol. 1·05 cc. E. = 19,015,000 tubercle bacilli per cc.]

Date—August 13th, 1904.

Weight at Inoculation—7 cwt. 3 qrs. 5 lbs.

Killed when dying—September 20th, 1904. [38 days after inoculation.]

Clinical Notes.

The cow was inoculated on August 12th, 1904. Nine days later a few tubercle bacilli were found in centrifuged milk from the L.F. quarter. None were found in milk from R.H. quarter. Both inoculated quarters of the udder were indurated.

On August 29th, seventeen days after inoculation, the inoculated quarters were greatly increased in size and very hard. The milk was greatly diminished in quantity.

On August 31st, less than half pint of milk was obtained from each of the inoculated quarters. It was yellower in colour than that from the other quarters, and contained numerous flakes. The injected quarters were very hard and tense, and rapidly increasing in size. Œdema was already appearing about the root of the R.H. nipple.

The temperature was very high (41·0°C.) and the cow was losing weight, but its general appearance was fairly good.

On September 5th the secretion from the infected quarters was a yellow turbid serum, containing whitish flakes and coagula, and amounted to only a few ounces daily. There was a great mass of œdema in front of the udder. The cow was getting very thin, and ate little. The temperature was very high (40·7°C.).

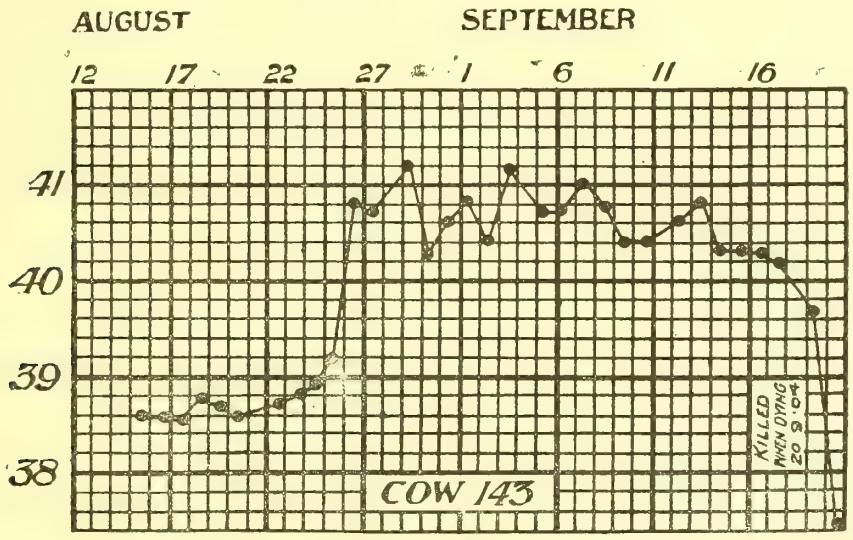
On September 20th it was killed when in a dying condition, 38 days after inoculation.

Microscopic Examination of Milk from Inoculated Quarters.

August 31st (19th day)	L.F. quarter. — No tubercle bacilli.
	R.H. quarter.—One tubercle bacillus seen.
September 5th (24th day)	L.F. quarter.—No tubercle bacilli.
	R.H. quarter.—Several tubercle bacilli seen.
September 9th (28th day)	L.F. quarter.—No tubercle bacilli.
	R.H. quarter. — Seventeen tubercle bacilli seen.
September 13th (32nd day)	R.H. quarter (morning).—Tubercle bacilli fairly numerous.
	R.H. quarter (afternoon).—Tubercle bacilli numerous.
September 19th (37th day)	L.F. quarter. — Tubercle bacilli (seven seen).
	R.H. quarter. — Tubercle bacilli fairly numerous.
September 20th (38th day)	L.F. quarter. — Tubercle bacilli fairly numerous.
	R.H. quarter. — Tubercle bacilli numerous.

Note.—The milk from the non-inoculated quarters of the udder was examined microscopically on September 19th and 20th. No tubercle bacilli were found. For table of milk injections into guinea-pigs, see p. 627.

Temperature.



Weights.

The cow lost one-fifth of its original weight during the experiment.

	cwts.	qrs.	lbs.	
August 13th, 1904	7	3	5	Inoculated the preceding day.
August 30th, 1904	7	1	16	
September 14th, 1904	6	2	1	
September 19th, 1904	6	0	21	Killed the following day.

Total Loss of Weight during Experiment.—1 cwt. 2 qrs. 12 lbs.

Average Rate of Loss per Week.—1 qr. 6 lbs.

Tuberculin Test.

The cow was not tested subsequent to inoculation.

GUINEA-PIGS INOCULATED WITH MILK OF COW 143.

Date.	Number of Guinea-pig.	Quarter of Udder.	Killed or Died.	Duration of Intra-peritoneal.	Life in Days, Subcu-taneously.	Result.	
August 13, 1904. Before injection.	378	R.H.	Killed	144		No T.	
	379		„		144	Healthy	
	380	L.H.	„	144		„	
	381		„		144	„	
	382	R.F.	„	144		No T.	
			„		144	Healthy	
	384	R.H.	„	144		„	
	385		„		144	„	
August 31, 1904.	396	L.H.	Died	105		G.T.	Non-inoculated quarters.
	397		Killed		105	Healthy	
	398	R.F.	„	105		„	
	399		„		105	„	
	400	L.F.	Died	48		G.T.	
	401		Killed		49	Slight T.	
	402	R.H.	Died	40		G.T.	
	403		„		85	„	

POST-MORTEM EXAMINATION.

General Condition.—Very thin in outward appearance, but there was a considerable quantity of fat, especially in the mesentery and elsewhere in the abdomen.

Udder.—There was an enormous amount of œdema about and in front of the udder. The udder itself was enormously enlarged, and unsymmetrical in shape, owing to the increase of the inoculated quarters only. It weighed 35 lbs. 4 ozs.

Inoculated Quarters.—On section the inoculated quarters were very firm, and were composed almost entirely of yellow caseating tubercles, which had to a greater or less extent coalesced, leaving in the more superficial parts of the gland only a network of congested tissue between them. The upper part of the gland was in each case the least affected. The upper and anterior corner of the right hind quarter was yellow and fibrous, and showed here and there scattered tubercles. About the upper third of the left fore-quarter was similar.

The milk sinuses were dotted with little ruby-coloured elevations with yellow centres.

Non-Inoculated Quarters.—The non-inoculated quarters were soft and yellow; the sinuses contained a little opalescent fluid full of flakes. There was no appearance of tubercle in these quarters, which appeared to be considerably atrophied. The line of demarcation between inoculated and non-inoculated quarters was very distinct.

Supramammary Lymphatic Glands.—Four in number, were enormously enlarged. There was a flat layer of blood just outside the capsule covering a portion of each gland.

The right posterior gland measured 7 in. by 5 in. by $2\frac{3}{4}$ in., and weighed 1 lb. 11 ozs. The anterior and smaller gland was the size of a hen's egg. The left posterior gland measured 6 in. by 5 in. by $2\frac{1}{2}$ in., and weighed 1 lb. 4 ozs. The anterior and smaller gland was disc-shaped, and measured $1\frac{1}{4}$ in. by $1\frac{1}{2}$ in.

On section the glands on the right side were much congested, and caseating throughout. The glands on the left side were similar, but not quite so advanced.

Popliteal Glands.—Normal.

Precrural Glands.—Were slightly enlarged. The left showed tubercles in the cortex. The right had a somewhat suspicious appearance, but no definite tubercles could be seen.

Abdomen.

Peritoneum, Omentum.—Normal.

Intestines, Mesenteric Glands.—Normal.

Spleen.—Normal.

Liver.—Was large. On its surface were numerous purple black spots up to $\frac{1}{4}$ in. in diameter. These were seen to have a moss-like configuration. Section showed that they penetrated to a depth equal to their diameter, and had an angiomatous structure. They occurred beneath the surface also. The substance of the liver was pale and yellowish. Close inspection showed each section to be mottled with little bright yellow points, which appeared to be the centres of the lobules. Some of the yellow points were larger, and could be seen through the capsule. There was no appearance of tubercle. The bile ducts were thickened and calcareous, and contained flukes.

Hepatic Glands.—In one only a single tubercular focus was found.

Kidneys.—Were large and rather pale, but apparently normal.

Suprarenals.—The right contained in its cortex a nodule nearly $\frac{1}{4}$ in. in diameter, pinkish in colour. with a paler centre. It did not look like a tubercle.

Renal Glands, Lumbar Glands.—Were not obviously affected.

Iliac Glands.—Were much enlarged, especially the right, which measured 5 in. by $4\frac{1}{2}$ in by 2 in., and weighed 10 ozs. The left weighed 6 ozs.

On section they were soft, and had their cortices packed with numerous cream-coloured tubercles. The left was more advanced than the right, about a third of its cortex being entirely composed of caseating tissue.

Thorax.

Pleura.—Normal.

Lungs.—Both lungs showed a considerable amount of interstitial emphysema. The right, over a considerable portion of its surface, was purple in colour. This discolouration was somewhat patchy, and confined to the superficial lobules. In these congested portions a considerable number of very minute greyish points could be seen. These early tubercles appeared to be scattered

throughout the lungs, but they probably would have escaped notice if they had not been shown up by the congestion of the right lung.

Thoracic Glands, Pericardium, Heart.—Normal.

Special Glands.

Prescapular, Prepectoral, Axillary, Gluteal, Ischiatic, Submaxillary, Parotideal, Pharyngeal, Hyoid —Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

Microscopical Examination.

Tubercle from Right Lung.—Tubercle bacilli, several seen.

Scraping from Left Lung.—Tubercle bacilli, two only seen.

Liver —(Yellow focus from).—One tubercle bacillus.

Liver.—(Another focus from).—Two tubercle bacilli.

Liver—(A purple spot).—No tubercle bacilli.

Suprarenal—(Central part of pinkish spot).—No tubercle bacilli.

Spleen.—No tubercle bacilli.

Left Precrural Gland.—Tubercle bacilli numerous.

Right Precrural Gland.—Tubercle bacilli, seven seen.

Posterior Thoracic Gland.—No tubercle bacilli.

GOAT 23. [Male.] (Virus H 28. "C.L.")

Subcutaneous Inoculation of emulsion of prepectoral and deep cervical glands from Calf 515.

Dose—5,000,000 tubercle bacilli. [Vol. 0·26 cc. E. = 19,015,000 tubercle bacilli per cc.]

Date—August 12th, 1904.

Weight at Inoculation—3 qrs. 3 lbs.

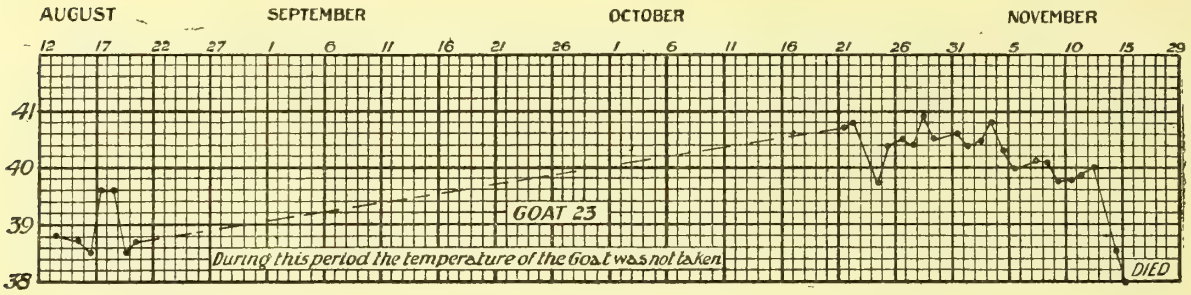
Died—November 16th, 1904 (96 days after inoculation), of tuberculosis, complicated by pleurisy of micrococcal origin.

Clinical Notes.

The goat was inoculated on August 12th, 1904. On November 16th, 96 days after inoculation, it was found to be dead.

The animal remained apparently well for a long time after inoculation. A moderate-sized swelling only appeared at the seat of inoculation, and this sloughed, as it almost always does in goats. Although the animal did not as yet appear in any way ill, yet it was observed to be very quiet, and to have lost its former playfulness. About a month before death it was unwell; a day or two later the temperature was taken, and was found to be between 40 and 41·0° C. After this the animal grew slowly worse and became very thin; about 10 days before death the respiration was seen to be accelerated, but it was never distressing. During the last few days of its life it was obviously extremely ill, lying down most of the time, its head resting on the manger; its nose was very dry, and its respiration somewhat laboured.

Temperature.



Weights.

The goat lost one-third of its original weight during the experiment.

	qrs.	lbs.	
August 12th, 1904 - - -	3	3	Inoculated.
August 30th, 1904 - - -	3	4	
[Two months' interval]			
October 21st, 1904 - - -	2	17	
November 8th 1904 - - -	2	8	
November 16th, 1904 - - -	2	2	Died.

Total loss of weight during experiment.—1 qr. 1 lb.

Average rate of loss per week.—2·1 lbs.

Tuberculin Test.

The goat was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

Local Lesion.—At the seat of inoculation was an ulcer about $2\frac{1}{4}$ in. by $1\frac{3}{4}$ in., with undermined edges, and dirty looking surface bathed in foul-smelling pus. At the base of the ulcer numerous caseating points could be seen.

Right Prescapular Gland.—Was much enlarged, and measured 3 in. by $2\frac{3}{4}$ in. by 2 in. It was fluctuating, and consisted of a thin bag full of caseous masses and purulent fluid.

Left Prescapular Gland.—Slightly enlarged and caseous throughout.

Prepectoral Glands.—A prepectoral gland, slightly enlarged, was caseous throughout.

Axillary Glands.—Normal.

Cervical Glands.—A right deep cervical gland contained a caseous nodule.

Thorax.

Pleura.—On the right side there was universal pleurisy, and the lung was fixed by soft adhesions to the costal wall. The costal pleura, the right half of the diaphragmatic pleura, and the pleural surface of the right side of the pericardium, together with the right surface of the right lung, was covered with a layer of plastic lymph of a dirty yellowish white colour, and of gelatinous consistence.

Lungs.—Both lungs were heavy, and collapsed but little. The right was considerably larger than the left, and weighed 1 lb. 7 ozs. The latter weighed 1 lb.

The surface of each was studded with large tubercles, many of which were a quarter of an inch in diameter. They were but slightly raised, of a greyish white colour, and had a narrow margin, darker and more translucent; some also had a small yellow centre.

On section the lung was seen to be fairly closely packed with yellow pea-sized tubercles, which were for the most part composed of dense greyish tissues containing small yellowish points; the more posterior, however, had softened contents, and many of them appeared as little cavities.

The lung tissue between the tubercles was congested, and in some places there were small dark red translucent areas of consolidation.

Bronchial and other Thoracic Glands.—Were much enlarged, and remarkably firm. The large posterior thoracic measured 6 in. by $1\frac{1}{4}$ in. by $\frac{5}{8}$ in. On section its cortex was entirely composed of dense yellowish grey tissue, which contained opaque foci. The other thoracic glands were similar.

Heart.—Normal.

Abdomen.

Peritoneum, Omentum.—Normal.

Intestines.—In the small intestine was a small ulcer, about $\frac{1}{4}$ in. in diameter, with thickened margins. In the large intestine were two smaller ulcers.

Mesenteric Glands.—Were somewhat enlarged. Almost without exception they contained tuberculous nodules, grey, translucent, and with caseous points. Some of the nodules were as much as half an inch in diameter.

Spleen.—The spleen contained a good many hard yellow tubercles about the size of shot. About two dozen were counted in one broad section.

Liver.—Three small tubercles only were seen in the liver.

Hepatic Glands.—Were moderately enlarged, and similar to the thoracic, though slightly less advanced.

Kidneys.—The kidneys on the surface appeared to be peppered all over with minute yellow points. These were seen on section to be thickly distributed in the cortex, and also formed radial streaks in the papillæ. They appeared to be caused by a deposit of urates.

Suprarenals.—Left was normal. Right not found.

Renal Glands, Lumbar Glands.—Contained caseating nodules.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural.—Left contained caseous nodules. Right normal.

Popliteal.—Normal.

Submaxillary.—Contained each a small nodule.

Pharyngeal.—Were enlarged, and contained large grey translucent tuberculous nodules with caseous points.

Tongue, Palate, Tonsils, Pharynx.—Normal.

Eyes.—There was a small blood clot in the anterior chamber of the right eye, but there was no appearance of tubercle in it. Left eye was normal.

Microscopical Examination.

Pus from Prescapular Gland.—Tubercle bacilli, very straight and uniformly stained, together with faintly stained bacilli and cocci.

Scraping from Pleura.—Numerous minute organisms. (diplococci ?).

Scraping from Kidney (unstained).—No crystals seen.

Ulcer from Small Intestine.—Tubercle bacilli numerous.

MONKEY 63. (Virus H 28. "C.L.")

Fed on one occasion only with milk from Cow 143.

Dose—5,000,000 tubercle bacilli. [Vol. 90 cc. of milk containing 55,000 tubercle bacilli per cc.]

Date—September 14th, 1904.

Weight when fed—890 grammes. [Age about 4 months.]

Died—December 11th, 1904. [88 days after feeding.]

Clinical Notes.

The monkey was fed on September 14th, 1904. It did not grow much, but remained apparently well, and was not known to be infected until the end. After its fellow, No. 65, died on December 3rd, it fretted and pined, and died eight days later, on December 11th, 88 days after it was fed.

Temperature.

Not recorded.

Weights.

A fortnight before the commencement of the experiment the weight was 890 grammes. At death the monkey weighed 900 grammes. Thus there was no appreciable alteration in weight during the experiment.

Tuberculin Test.

The monkey was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

Tongue, Palate, Buccal Pouches, Pharynx, Larynx.—Normal.

Submaxillary Glands.—Normal.

Cervical Glands.—The right deep cervical contained a small caseous tubercle. The left was normal.

Stomach, Oesophagus.—Normal.

Small Intestine.—In the small intestine there were eight small tubercular lesions in an early stage of ulceration. They consisted of thickenings of the mucous membrane, which in some measured as much as half an inch in diameter, with an irregular dark central slough in some, in others a superficial ulcer. Some extended transversely to the gut, while others were more or less rounded. The peritoneal surface of those lesions was raised, and in some was surmounted by pin-head tubercles.

The terminal inch and a half of the ileum was closely incorporated with a mass of caseous mesenteric glands. The mucous membrane was dark in colour, rough, and superficially ulcerated. At the commencement of this area was a ring-shaped ulcer, a quarter of an inch in diameter, with a dark grey ragged floor, entirely surrounding the gut. Beyond this, the ulceration was superficial and irregular, and the congestion extended on to the cæcal surface of the valve, which was slightly constricted.

Large Intestine.—There was a little group of four ulcers in the large intestine, about eight inches from the ileo-cæcal valve.

Mesenteric Glands.—The duodenum for a distance of 2 inches, together with the pancreas, were closely adherent to a large lobulated mass of mesenteric glands, from which they could be separated with difficulty. With the same mass of glands were also incorporated the cæcum and the terminal portion of the ileum. The atter, for the distance of 1 in. was darkly congested, its walls thickened and studded with tubercles. The large mass of mesenteric glands was lobulated, about the size of a large walnut, soft, and advanced in caseation.

Mesocolic Glands.—In the mesocolon there was a caseous gland as large as a pea, near its attachment to the sacrum. The smaller glands lying along the intestinal margin were all of them caseous until the mid point was reached. Beyond this they were normal.

Abdomen.

Peritoneum, Omentum.—Several small tubercles were seen on the omentum, which was adherent to the ileum and cæcum. The peritoneum elsewhere was normal.

Spleen.—Was about $1\frac{3}{4}$ in. long. It consisted chiefly of a collection of lobulated caseous masses of various sizes, up to that of a small bean, with a small amount of purple tissue between.

Liver.—The liver showed on the surface from twenty to thirty tubercles about the size of a large pin's head, yellow, with thin translucent overhanging margins. A few small tubercles were seen on section.

Hepatic Glands.—A small caseous focus was seen in one gland.

Kidneys.—Were pale. Each showed several minute tubercles on the surface. On section one tubercle only was seen in one of them.

Suprarenals.—Normal.

Coeliac Glands.—Were enlarged and caseating.

Lumbar Glands.—Normal.

Inguinal Glands.—Left contained a caseous nodule. Right, normal.

Thorax.

Pleura.—Normal.

Lungs.—The lungs were pale in colour, and studded with rather large solid nodules, which were congested at their margins. These were of all sizes, the smaller having yellow centres surrounded by a rather broad reddish grey translucent margin. In the left lung there were a good many larger nodules, which reached the size of a small pea. In the right lung some of them were larger still.

On section the amount of solid tuberculous tissue was greater than appeared on the surface. The larger nodules were found to be softening at their centres.

Glands in the Thoracic cavity.—There was a large mass of caseous lymphatic glands around the trachea, behind the manubrium sterni.

Pericardium.—There was a rather large excess of slightly turbid fluid in the pericardium, but there was no sign of tubercle in the serous membrane.

Heart.—On the surface of the right ventricle of the heart there was a single tubercle.

MONKEY 65. (Virus H 28. "C.L.")

Fed on one occasion only with milk from Cow 143.

Dose—5,000,000 tubercle bacilli. [Vol. 90 cc. of milk containing 55,000 tubercle bacilli per cc.]

Date—September 14th, 1904.

Weight when fed—850 grammes. [Age about 4 months.]

Died—December 3rd, 1904. [80 days after feeding.]

Clinical Notes.

The monkey was fed on September 14th, 1904. It did not grow much, but was not known to be infected until the day before its death, as up to this time it had remained apparently well. It was found to be dead on December 3rd, 80 days after it was fed.

Temperature.

Not recorded.

Weights.

A fortnight before commencement of experiment the weight was 850 grammes; the monkey weighed 860 grammes at death. Thus there was no appreciable alteration in weight during the experiment.

Tuberculin Test.

The monkey was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

Tongue, Pharynx.—Normal.

Pharyngeal Glands, Cervical Glands.—Normal.

Abdomen.

Stomach.—Normal.

Intestines.—The upper half of the small intestine was normal. About half way was found the first ulcer. This was irregular in outline, as broad as it was long, about $\frac{1}{4}$ in. in diameter, with thickened margins. An inch and a half further on was another and similar ulcer. Six inches further was a third, very similar, and 2 ins. beyond that another. Again 2 ins. further on were two quite small ulcers side by side. Another 4 ins. brought one to the largest ulcer yet seen, about $\frac{1}{2}$ in. in diameter surrounded by considerable thickening, which encircled the gut. Five inches beyond this was another large ulcer, as well as several small ones. From thence onwards to the ileo-cæcal valve was about 7 ins., and in this part there was a considerable number of little ulcers.

In the large intestine there was one small ulcer, $\frac{1}{8}$th in. in diameter, 4 ins. from the ileo-cæcal valve. Except for this, the large intestine was normal.

The larger ulcers, when seen from the surface, appeared as congested constricted zones studded with little tubercles. From each of these a thickened ridge of reddish colour, also studded with tubercles, led to the caseous mesenteric glands.

Mesenteric Glands.—The mesenteric glands were caseous and formed an irregular mass about the size of a walnut.

Mesocolic Glands.—Two only of the glands of the mesocolon were tuberculous; the rest were normal. A few little tubercles of the size of a pin's head were also seen in the mesocolon.

Peritoneum, Omentum.—There were three or four pin-head tubercles on the omentum, which was loosely adherent to the spleen.

Spleen.—Was enlarged, being $2\frac{1}{2}$ ins. long and $1\frac{1}{8}$ in. in its broadest part, and about $\frac{1}{8}$th of an in. thick. It was packed with irregular cream-coloured nodules, some of which projected on the surface.

Liver.—Showed on its surface a moderate number of tubercles, about the size of a pin's head, with a central opacity and a grey translucent margin. These were very like the pseudo-tubercles seen in guinea-pigs. Be sides these, the liver showed both on surface and on section a considerable number of minute pale points.

Kidneys.—Contained numerous small caseating tubercles. These were more numerous on the surface, but were also seen on section.

Thorax.

Pleura.—The pleura was for the most part normal, but a tubercle was found in the mediastinal fold between the pericardium and diaphragm, and another on the pleura of the right hand side of the pericardium.

Lungs.—Were studded with a moderate number of little tubercles, composed of a small yellowish centre, surrounded by a more or less translucent irregular greyish purple zone, the whole being about $\frac{1}{8}$th of an inch in diameter.

Bronchial Glands.—Not examined.

Pericardium.—The pericardial cavity contained a large excess of fluid.

Heart.—Normal.

Peripheral Lymphatic Glands.—Normal.

COMMENT ON TWO BABY MONKEYS, 63 AND 65.

(Fed each with 90 cc. of milk, of Cow 143, containing 5,000,000 bacilli).

These monkeys, which did not appear ill until a few days before they died, lived 88 and 80 days respectively after inoculation. They died almost within a week of one another, and the post-mortem appearances were almost identical, especially as regards the intestinal lesions. No lesions were found in the mouth or pharynx of either, though these have been common in older monkeys fed with tubercular material. But the disease fell with greatest severity upon the small intestine, and especially upon the terminal portion of the ileum. The mesenteric glands were severely affected.

The lungs, liver, spleen and kidneys all contained tubercles. The lungs of the two animals differed in the size and number of the nodules, but in neither were there large areas of consolidation nor any cavities.

BULL-CALF 469. (Virus H 28. "C.L.")

Subcutaneous Inoculation of emulsion of pure culture of tubercle bacilli derived from original material.

Dose—43 milligrammes.

Date—September 9th, 1904.

Weight at Inoculation—1 cwt. 1 qr. 16 lbs. [Age, about 16 weeks.]

Killed, when very ill—October 8th, 1904. [29 days after inoculation.]

Clinical Notes.

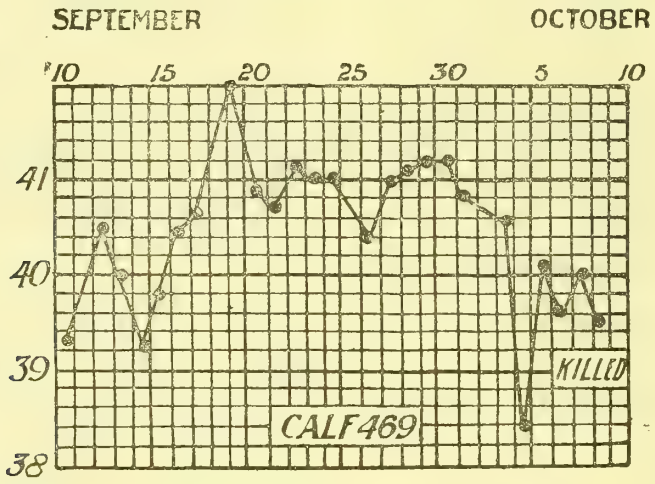
The calf was inoculated on September 9th, 1904.

Seventeen days later there was a solid tumour at the seat of inoculation, measuring 7½ by 4 in. The right prescapular gland was 5¼ in. long. The calf was unwell, and the temperature very high.

On October 3rd, the animal was very ill and thin; the respiration was much embarrassed, expiration forcible and noisy.

On October 4th it was thought to be dying, but on the following day it was rather better, and continued so until October 8th, when it was killed, 29 days after inoculation.

Temperature.



Weights.

During the first 18 days the calf gained 5 lbs.; afterwards it lost weight very rapidly.

	cwt.	qrs.	lbs.	
September 9th, 1904 - - -	1	1	16	Inoculated.
September 27th, 1904 - -	1	1	21	
October 8th, 1904 - -	1	0	23	Killed when very ill.

Total loss of weight during experiment.—21 lbs.

Average rate of gain per week during first 18 *days.*—2 lbs.

Average rate of loss per week during last 11 *days.*—16·5 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Very thin.

Local Lesion.—The tumour at the seat of inoculation weighed 12 ozs., and measured 6 in. by 3½ in. by 1¾ in. It was cracked and ulcerated on its surface, and infiltrated both skin and subjacent muscle, though not to the extent seen in Calf 489. There was some oedema around.

On section the tumour showed the usual tough necrotic tissue, and a large foul slough in process of separation.

Right Prescapular Gland.—Was much enlarged. It measured 4 in. by 2½ in. by 2 in., and weighed 6 ozs. On section it was composed partly of salmon pink necrotic tissue, and partly of caseating streaks and foci, embedded in an elastic translucent grey tissue.

Left Prescapular Gland.—Contained a few grey tubercles.

Right Prepectoral Gland.—As large as a cherry; was similarly affected to the right prescapular gland.

Left Prepectoral Gland.—Contained a few grey tubercles.

Pectoral Glands.—Right pectoral glands were enlarged and contained caseous foci, the rest of the gland being still soft.

Axillary Glands.—Each axillary gland contained one or more tubercles.

Cervical Glands.—A deep cervical gland was similarly affected to the right prescapular.

Thorax.

Pleura.—The lymphatic tufts on the diaphragm and costal pleura were increased, but no definite tubercles were seen in them.

Lungs.—Were similar to those of Calf 489. Around some of the tubercles in the posterior extremity of the left lung there was marked pigmentation. The right anterior lobe had undergone carnification, evidently of old standing, the bronchi were distended, and no tubercles were seen in this piece. Tubercles were seen to be developing in the hypertrophied fringes bordering some of the smaller lobes.

Bronchial and other Thoracic Glands.—Were much enlarged, and together weighed 9½ ozs. The large posterior thoracic gland alone weighed 4 ozs., and measured 5¼ in. by 2¼ in. by 1 in.

The glands were firm and elastic, and on section the cortex seemed to be composed entirely of translucent grey tissue, holding a network of confluent caseating foci. The medulla was congested. There was some œdema in the posterior mediastinum.

Heart.—A single tubercle was seen beneath the endocardium on the right auricle.

From the endocardium of the left auricle three minute translucent bodies projected. These were loosely attached, had a glittering appearance, and in each was a minute red spot. They somewhat resembled the ruby-like bodies occasionally seen along the margin of the spleen.

Abdomen.

Peritoneum, Omentum.—A few tubercles were seen on the omentum, and on the peritoneum lining the diaphragm.

Intestines.—Normal.

Mesentery.—The little white points seen in the mesentery of calf 489 were absent.

Mesenteric Glands.—Were not enlarged. Many of them contained one or more tubercles.

Spleen.—Was somewhat swollen, and much congested. Numerous grey tubercles were seen thickly scattered throughout its substance.

Liver.—The surface of the liver was uniformly spotted with small grey tubercles, scarcely any of which projected above the surface. Tubercles were seen also scattered throughout the liver substance. They were not quite so numerous as in Calf 489.

Hepatic Glands.—Were enlarged to double their normal size, the cortices being composed of dense grey tissue, packed with whitish points.

Kidneys.—Presented altogether an unusual appearance. Large areas of the cortex, whole lobules, portions of lobules, and patches of lobules, were of a pale ochre-red colour, and sharply defined. The patches themselves were somewhat mottled, with lighter and darker portions. A few small grey tubercles were seen on the surface of each kidney, and on section they were considerably fewer in number than in Calf 489.

Suprarenals.—Normal.

Renal Glands.—Showed numerous tubercles.

Lumbar Glands, Pelvic Glands, Iliac Glands.—Each contained a few tubercles.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Gluteal.—Each contained a few tubercles.

Ischiatic Glands, Sciatic Glands.—Normal.

Popliteal.—Contained several tubercles.

Submaxillary, Parotideal, Pharyngeal.—All contained a few tubercles.

Tongue, Palate, Tonsils, Pharynx.—Normal.

Nose.—Mucous membrane normal.

Eyes.—Normal.

Brain.—Normal.

Microscopical Examination.

Scraping from Intestine.—No tubercle bacilli.

BULL-CALF 489. (Virus H 28. "C.L.")

Subcutaneous Inoculation of emulsion of pure culture of tubercle bacilli derived from original material.

Dose—50 milligrammes.

Date—September 9th, 1904.

Weight at Inoculation—1 cwt. 2 qrs 3 lbs. [Age about 17 weeks.]

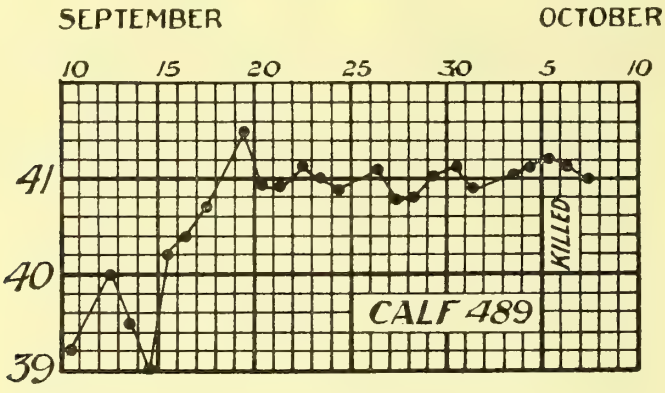
Killed, when dying—October 7th, 1904. [28 days after inoculation.]

Clinical Notes.

The calf was inoculated on September 9th, 1904. Seventeen days later there was a solid tumour at the seat of inoculation measuring $7\frac{1}{4}$ in. by $4\frac{1}{2}$ in., and the right prescapular gland was $5\frac{1}{2}$ in. long. The calf was unwell; its coat was staring, and its temperature very high (41·0°C.).

At the beginning of October the respiration became rapid and forcible, and the animal was thin and very ill. It rapidly grew worse, the respiration being increasingly difficult, and was killed when in a dying condition on October 7th, 1904, 28 days after inoculation.

Temperature



Weights.

The calf lost nearly a quarter of its original weight during the experiment.

	cwts.	qrs.	lbs.	
September 9th, 1904 - -	1	2	3	Inoculated.
September 27th, 1904 - -	1	1	18	
October 7th, 1904 - - -	1	0	19	Killed when dying.

Total loss of weight during experiment.—1 qr. 12 lbs.

Average rate of loss per week.—10 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Extremely thin.

Local Lesion.—The tumour at the seat of inoculation, on the right side of the neck, measured $5\frac{1}{2}$ in. by 4 in. by $2\frac{1}{4}$ in., and weighed 1 lb. It was of the infiltrating type, both muscle and skin being involved; there was considerable œdema round its lower part, extending to the jaw.

On section the central part of the tumour consisted of a tough orange pink mass of necrotic tissue; the rest of caseating nodules infiltrating skin or muscle.

Right Prescapular Gland.—Measured 5 in. by $2\frac{3}{4}$ in. by $1\frac{1}{4}$ in., and weighed 7 ozs. It was composed partly of tough salmon pink necrotic tissue, and partly of yellow caseating foci, embedded in grey translucent tissue.

Left Prescapular Gland.—Contained a few small tubercles.

Prepectoral Glands.—Right prepectoral gland, as large as a cherry, was similarly affected to the right prescapular; as was also a long gland ($1\frac{1}{2}$ in.) lying on the ventral side of the trachea, and the left prepectoral.

Pectoral Glands.—Right pectoral gland was enlarged, and contained caseating nodules.

Left pectoral glands each contained a few small tubercles.

Axillary Glands.—Contained discrete tubercles.

Cervical Glands.—Deep cervical glands each contained a few small tubercles.

Thorax.

Pleura.—On the pleural surface of the diaphragm were one or two pedunculated tubercles, and on the costa pleura a line of early tuberculous deposit was to be seen along the posterior margin of many of the ribs.

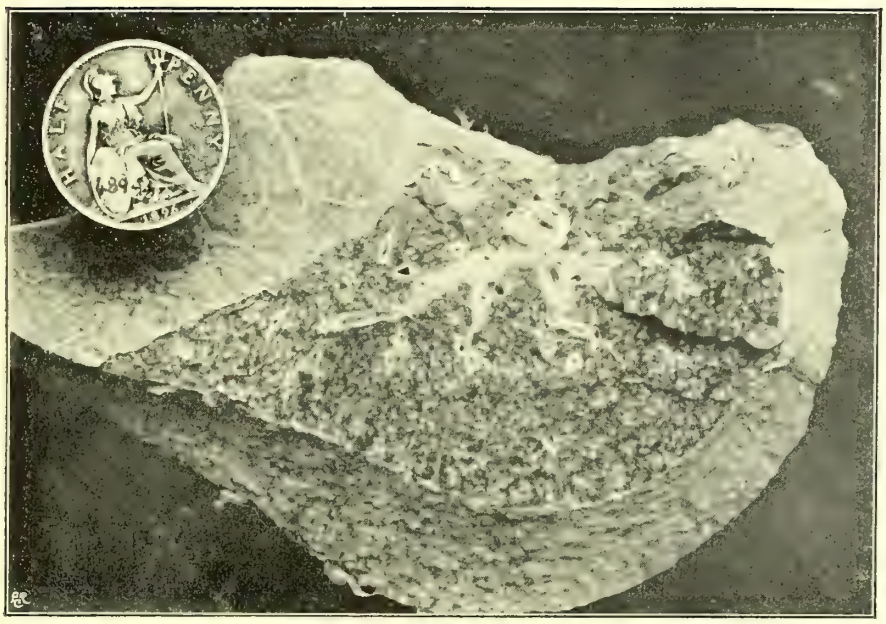
Lungs.—Were heavy, and weighed 6 lbs. The smaller lobes, together with the inferior and anterior parts of the larger lobes, were of a dark pink colour, and almost entirely airless. They were everywhere packed with minute tubercles, which appeared most numerous, or at least were more conspicuous, in the darker solid parts. Here they appeared as pale grey spots on a darker ground, while elsewhere they were much the same colour as the surrounding lung tissue, being visible chiefly on account of a narrow dark grey translucent (?) margin.

Bronchial and other Thoracic Glands.—Were much enlarged, and weighed $6\frac{1}{4}$ ozs. The posterior thoracic alone weighed $2\frac{1}{2}$ ozs., and measured $5\frac{3}{4}$ ins. by 2 ins. by 1 in.

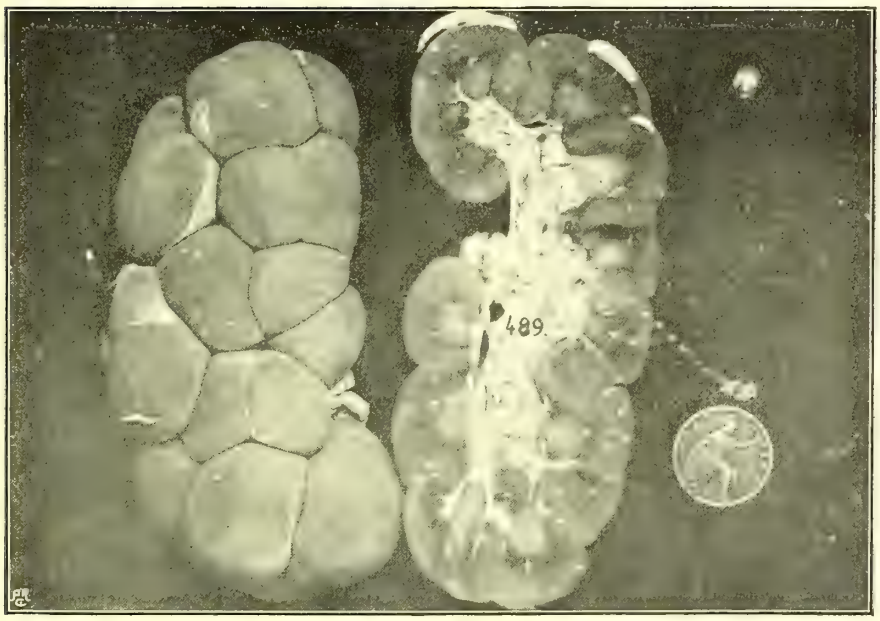
These glands were all firm on section, the cortices being composed of greyish tissue, packed with yellowish points and networks in an early stage of caseation.

There was œdema in the dorsal mediastinum.

Heart.—Three tubercles were seen in the right auricle.



CALF 489. Subcutaneous. Virus H 28. "C.L."
Right middle lobe of lung. (*See* page 635.)



CALF 489. Subcutaneous. Virus H 28. "C.L."
Kidney. (*See* page 636.)

(*To face page 655.*)

One, nearly an eighth of an inch in diameter, was embedded in the muscular wall: the others projected from the surface of the endocardium.

Abdomen.

Peritoneum, Omentum.—The great omentum was sparsely studded with loosely attached lenticular tubercles, about an eighth of an inch in diameter. A few of these tubercles were seen on the lesser omentum, and one or two on the peritoneum lining the abdominal wall and the diaphragm.

Intestines.—Normal.

Gastric Glands.—The glands about the cardiac end of the stomach, lying along the attachments of the omenta to the rumen, were all swollen, and contained tubercles.

A gland in the lesser omentum, close to the pylorus, was enlarged to double the normal size, the cortex being composed of dense grey tissue, packed with whitish points.

Pancreatic Glands.—The smaller glands found in the substance of the pancreas each contained one or two tubercles.

Mesentery.—Was thickly peppered with minute whitish points, together with some rather larger tubercles.

Mesenteric Glands.—Were normal in size. Almost every gland contained several small grey tubercles.

Spleen.—Was large, and showed no tubercles on its surface. On section no conspicuous tubercles were to be seen, but every Malpighian body was firmer and whiter than normal, and doubtless represented a commencing tubercle.

Liver.—Was somewhat swollen, and pale orange pink in colour. It was very thickly studded with light grey tubercles, some of which projected slightly on the surface, while others were seen more or less dimly through a layer of liver substance, thus giving the surface of the organ a somewhat mottled appearance. On section the liver was very pale, and contained grey tubercles, scattered throughout the substance.

Hepatic Glands.—Were enlarged to double their normal size, the cortices being composed of dense grey tissue, packed with whitish points.

Kidneys.—Both kidneys appeared to be slightly swollen, and were pinker than normal. They were thickly mottled with tubercles, which scarcely reached the surface, and many of which were in consequence dimly seen. Thus the surfaces of the kidneys resembled somewhat those of the liver, but the tubercles were neither so large nor so numerous.

The kidneys on section showed a considerable number of tubercles scattered throughout the cortex. They had somewhat dim outlines, with translucent margins and whitish centres. The medulla was free from them.

Suprarenals.—Both contained several small pearly tubercles in their cortices.

Renal Glands, Lumbar Glands.—Like the hepatic, were packed with grey nodules containing caseating points.

Sacral Glands, Pelvic Glands, Iliac Glands.—Contained discrete tubercles.

Genito-Urinary System.

Testes.—Right contained a single tubercle. Left, normal.

Special Glands.

Precrural, Gluteal, Popliteal.—Contained discrete tubercles.

Ischiatic.—Both were very small, and not affected.

Sciatic.—Contained discrete tubercles.

Submaxillary, Parotideal, Pharyngeal, Hyoid.—All contained several tubercles.

Tubercles were found in many of the hæmolymph glands.

Tongue, Palate, Tonsils, Pharynx.—Normal.

Brain.—Normal.

Eyes.—A single small tubercle could be seen in the choroid of the right.

Microscopical Examination.

Scraping from Spleen.—Tubercle bacilli fairly numerous

Scraping from Lung.—Tubercle bacilli numerous.

Emulsion of Prepectoral Gland.—Rich in tubercle bacilli.

CALF 813. (Virus H 28. "C.L.")

Subcutaneous Inoculation of Culture from Human Cervical Glands, direct.

Dose—10 milligrammes.

Date—June 8th, 1905.

Weight at Inoculation—3 qrs. 6 lbs.

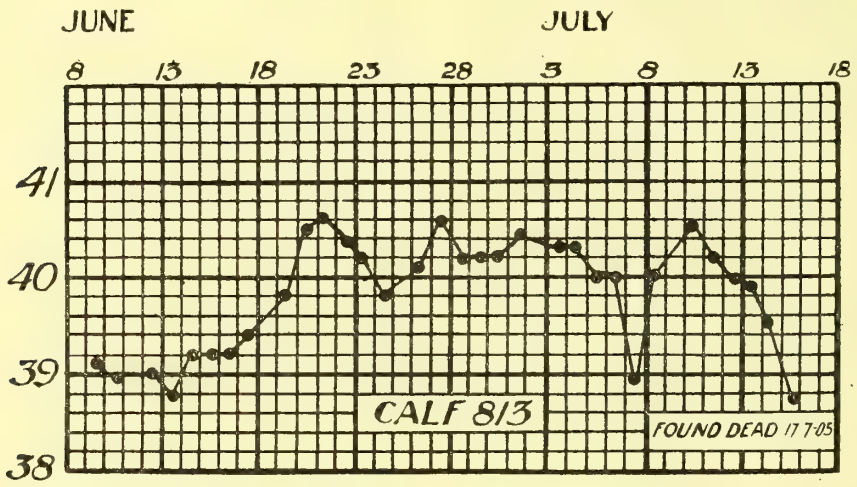
Died—July 17th, 1905. [39 days after inoculation.]

Clinical Notes.

The calf was inoculated on June 8th, 1905.

The course of the disease was similar to that usually seen in calves suffering from acute tuberculosis. On July 17th the animal died, 39 days after inoculation.

Temperature.



Weights.

During the first 12 days the calf gained 6 lbs.; after this it lost weight rapidly.

	qrs.	lbs.	
June 8th, 1905 - - - -	3	6	Inoculated.
June 20th, 1905 - - - -	3	12	
July 17th, 1905 - - - -	2	17	Died.

Total loss of weight during the experiment.—17 lbs.

Average rate of loss per week.—3 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Thin.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a flat tumour, which measured 4 in. by 3 in. by $1\frac{3}{4}$ in. It was dense, salmon-pink, fibro-necrotic, extensively infiltrated skin and subjacent muscle, and had a small irregular central cavity containing clear serum.

Right Prescapular Gland.—Was enlarged, and measured 3 in. by $1\frac{1}{2}$ in. by $1\frac{1}{4}$ in. Its cortex was caseo-necrotic, for the most part salmon-pink, but elsewhere yellowish and speckled with grey foci.

Left Prescapular Gland.—Contained caseating tubercles and nodules.

Right Prepectoral Gland.—The size of a cherry, was caseo-necrotic throughout.

Axillary Glands.—Contained caseating tubercles or nodules.

Cervical Glands.—A deep cervical gland on the right side was enlarged, and its cortex in an early stage of caseation.

Thorax.

Pleura.—Along the margins of many of the ribs were lines of small tubercles embedded in the hypertrophied and congested lymphatic fringes.

Lungs.—Were rather heavy, and weighed 3 lbs. 4 ozs. Portions of the anterior and even of the other lobes were dark red and solid. The surface was everywhere studded with tubercles, with opaque grey centres slightly raised, and an irregular or angular dark reddish-grey margin. Section showed more disease than appeared on the surface. Small irregular yellowish grey tubercles were thickly scattered throughout. The lung tissue was oedematous and congested, and there were many little irregular areas of consolidation.

Trachea.—There was a single small tubercle in the trachea, just beyond the larynx.

Thoracic Glands.—Were slightly enlarged and firmer than normal. They consisted of irregular yellow confluent foci, embedded in firm translucent grey tissue.

Heart.—Normal.

Abdomen.

Peritoneum, Omentum.—Normal.

Intestines.—A few (seven counted) small solid yellowish tubercles were seen in the mucous membrane of the small intestine. The large intestine was normal.

Mesenteric Glands.—Tubercles and tuberculous nodules similar to those seen in other lymphatic glands were seen in all the mesenteric. Some of the larger nodules, of the size of small peas, were grey and translucent, with a ramifying moss-like caseous centre.

Spleen.—Was packed with tubercles, some of which were rather large, up to an eighth of an inch in diameter.

Liver.—Was studded with many small tubercles about a sixteenth of an inch in diameter. Section showed that these were scattered thickly throughout the organ.

Hepatic Glands.—Were moderately enlarged, and very much resembled the thoracic.

Kidneys.—The surfaces were mottled with innumerable small scarcely visible tubercles. A small number of larger tubercles also could be seen on the surface. Section showed the tubercles scattered throughout the organ, but the smaller ones were less distinct than on the surface.

Suprarenals.—Two small tubercles were seen in the left; the right was normal.

Renal Glands, Lumbar Glands.—Were packed with caseating tubercles.

Iliac Glands.—Contained caseating tubercles or nodules.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Pharyngeal, Hyoid.—All contained caseating tubercles or nodules.

Tongue.—Normal.

Tonsils.—Contained tubercles.

Pharynx.—Tubercles were seen on the corrugated mucous membrane of the pharynx, and on the pharyngeal surface of the palate.

Brain.—Normal.

Eyes.—Normal.

Microscopical Examination.

Tubercle from Small Intestine.—Tubercle bacilli numerous.

CALF 815. (Virus H 28. "C.L.")

Subcutaneous Inoculation of Culture from Human Cervical Glands, direct.

Dose—10 milligrammes.

Date—June 8th, 1905.

Weight at Inoculation—3 qrs. 16 lbs.

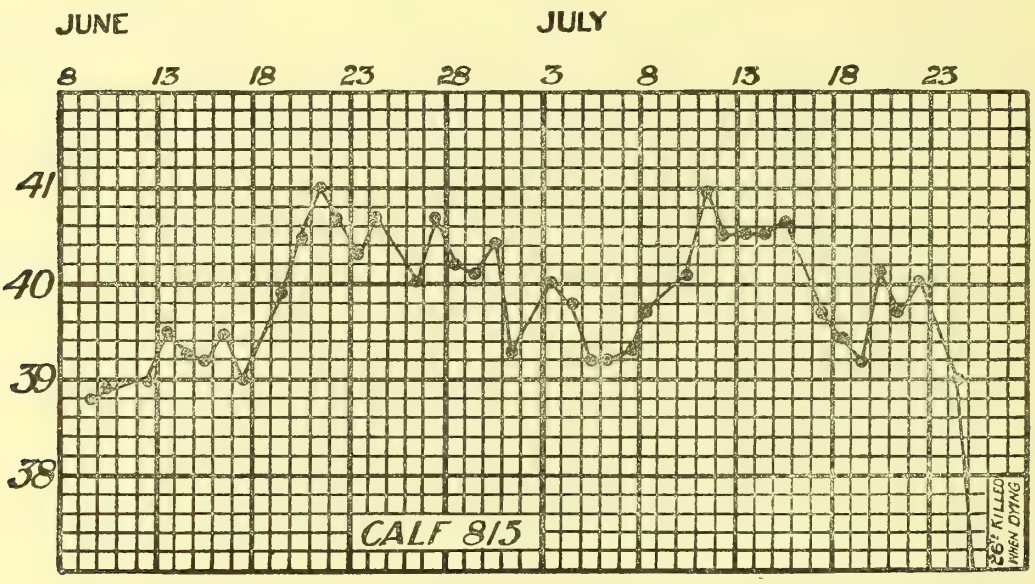
Killed when dying—July 26th, 1905. [48 days after inoculation].

Clinical Notes.

The calf was inoculated on June 8th, 1905. The course of the disease was similar to that usually seen in calves suffering from acute tuberculosis.

On July 26th, 48 days after inoculation, the calf was killed when in a dying condition.

Temperature.



Weights.

The weight remained practically stationary for the first twelve days; during the remaining period of the experiment there was a considerable loss.

	qrs.	lbs.	
June 8th, 1905 - - - -	3	16	Inoculated.
June 26th, 1905 - - - -	3	18	
July 26th. 1905 - - - -	2	26	Killed when dying.

Total loss of weight during experiment.—18 lbs.

Average rate of loss per week.—2·6 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Thin.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a flattened tumour, 5 in. by 3½ in. by 2 in., composed of dense salmon pink caseo-necrotic tissue, with an irregular network of communicating little cavities. It contained serum in its centre, and infiltrated skin and subjacent muscle. It weighed 11 ozs.

Right Prescapular Gland.—Was enlarged, 3½ in. by 2 in. by 2 in. It was salmon pink and caseo-necrotic throughout.

Left Prescapular Gland.—Was packed with caseating tubercles.

Right Prepectoral Gland.—Was very small. It contained a tubercular focus.

Right Axillary Gland.—Was packed with caseating tubercles.

Left Axillary Gland.—Normal.

Cervical Glands.—Several deep cervical glands were enlarged, firm and caseating.

Thorax.

Pleura.—A few tubercles were seen on the costal pleura.

Lungs.—The lungs were less severely affected than is usually seen in similar cases. On the surface rather large tubercles, surrounded by an irregular red margin, were sparsely scattered, and a fairly large number of red patches, more or less rectilinear in outline, were scattered over all the lobes. On section these latter were found to be consolidated lobules, composed of greyish yellow foci embedded in dark red solid gelatinous tissue. Rather large caseous tubercles, ⅛ in. in diameter, were scattered sparsely throughout the organ.

Trachea.—There was one tubercle in the trachea, just below the larynx.

Thoracic Glands.—Were considerably enlarged. They were firm, grey, and thickly infiltrated with a caseating network. There was a considerable amount of œdema around them.

Heart.—Normal.

Abdomen.

Peritoneum, Omentum.—Showed a moderate number of small tubercles.

Intestines.—Throughout the small intestine were sparsely scattered tuberculous patches, sometimes as much as ¼ in. in diameter. They had firm irregular yellow centres.

In the large intestine a moderate number of small elevations were seen in the mucous membrane. Under these were found solid yellow foci, closely incorporated with surrounding tissues.

Mesenteric Glands.—Were large and firm. All of them contained tuberculous nodules, grey, with a caseating network. In some the cortex was almost entirely composed of this tissue.

Spleen.—Was firm, and thickly packed with pea-sized yellow tubercles.

Liver.—The liver was thickly studded with tubercles of various sizes, the larger $\frac{1}{6}$ in., a few even $\frac{1}{4}$ in. in diameter, raised from the surface. Others of various sizes were more or less clearly seen according to their depth. Rather numerous tubercles of various sizes were seen on section, and tubercles were seen in the walls of the hepatic vein reaching to the intima.

Hepatic Glands.—Were very much enlarged, and on section resembled the thoracic.

Kidneys.—There were a moderate number of tuberculous nodules in each kidney, varying in size up to that of a small pea, with very irregular caseous centres. Many of them dipped into the cortex in a wedge-like manner. Besides this there were a number of irregular pale spots, evidently composed of the same tissue as the rest of the kidney.

Suprarenals.—In the right were one or two insignificant tubercles. Left normal.

Renal Glands.—Were packed with caseating tubercles.

Cœliac Glands.—Were very much enlarged, and on section resembled the thoracic.

Lumbar Glands, Left Iliac Gland.—Were packed with caseating tubercles.

Right Iliac Gland.—Was somewhat less affected than the left.

Genito-Urinary System.

Testes.—Left contained a pea-sized tubercle. Right normal.

Special Glands.

Precrural, Pubic, Gluteal, Popliteal.—Were packed with caseating tubercles.

Ischiatic.—Were not seen.

Submaxillary, Parotideal, Pharyngeal, Left Hyoid.—All were packed with caseating nodules.

Right Hyoid.—Was somewhat less affected.

Tongue, Palate, Pharynx.—Normal.

Eyes.—Normal.

Microscopical Examination.

Tubercle from Small Intestine.—Tubercle bacilli.

Tubercle from Cœcum.—Tubercle bacilli.

CALF 863. (Virus H 28. "C.L.")

Subcutaneous Inoculation of Culture derived from Rabbit 102.

Dose—10 milligrammes.

Date—August 30th, 1905.

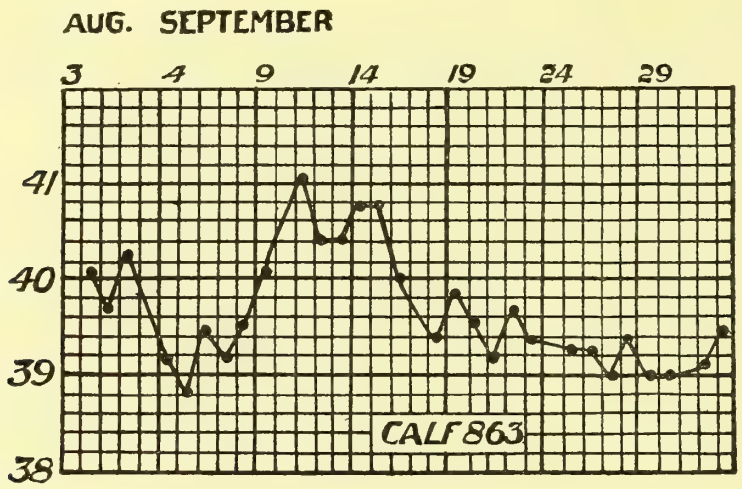
Weight at Inoculation—1cwt. 1 qr. 2 lbs.

Killed—November 28th, 1905. [90 days after inoculation.]

Clinical Notes.

The calf was inoculated on August 30th, 1905. It was killed on November 28th, ninety days later. The calf suffered from the usual constitutional disturbance at the commencement of the experiment, and the temperature was above the normal for the first two months, but the animal was in good health and condition when killed.

Temperature.



During October and November the temperature remained normal.

Weights.

The calf did not grow much during the experiment.

	cwt.	qrs.	lbs.	
August 30th, 1905 - -	1	1	2	Inoculated.
November 28th, 1905 - -	1	1	26	Killed.

Total gain of weight during experiment.—24 lbs.

Average rate of gain per week.—1·8 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—At the seat of inoculation was an elongated prominent swelling, which measured 5 in. by 2½ in. by 1 in., and weighed 6 ozs. On section it was solid, salmon pink, fibro-necrotic, with a small central cavity. The skin over it was thickened and closely adherent, but only slightly infiltrated. On the deeper surface was dense fibrous tissue, but the tumour did not infiltrate the muscle.

Right Prescapular Gland.—Was moderately enlarged, and measured 3 in. by 1½ in. by 1⅜ in. It weighed 2 ozs. About two-thirds was occupied by a caseo-necrotic nodule; the rest was soft and brown, and contained scattered calcareous grains.

Left Prescapular Gland.—Contained a moderate number of caseous tubercles.

Right Prepectoral Gland.—As large as a gooseberry. Was caseo-necrotic throughout, and had a very thick capsule.

Axillary Glands.—Right contained a moderate number of caseous tubercles. Left normal.

Cervical Glands.—A deep cervical gland was enlarged and fibrous, with a caseous network.

Thorax.

Pleura.—There was a large development of fibrous tubercles overhanging margins along the margins of the ribs, especially on the right side, and also on the pleural surface of the pericardium. There were large irregular patches of crowded fibrous tubercles, covered with red velvety fringes.

Lungs.—The lungs were pale and contracted well, their function being evidently not affected. On the surface were fairly numerous raised grey tubercles, very various in size, the larger being hemispherical, and the size of ordinary shot (five or six). They were very transparent, and even the larger ones had only very minute opaque centres, sometimes multiple. Many of the smallest ones were just like those produced by non-virulent viruses. When crushed there was no sign of calcification. On the margin of the lungs the villous fringes were replaced by fibrous tubercles or by a continuous grey plaque with scattered opaque foci.

On section a moderate number of small grey tubercles with small opaque centres was seen. These tubercles varied in size, but did not exceed ⅛ in. They were surrounded by a congested zone of lung tissue.

Trachea.—Normal.

Thoracic Glands.—Were moderately enlarged. The cortex everywhere contained numerous little irregular caseous foci.

Heart.—Normal.

Abdomen.

Peritoneum.—Normal.

Intestines.—Normal.

Mesenteric Glands.—Most of them contained little caseous tubercles, often aggregated together into little groups.

Spleen.—Was normal in size. On the surface were few small grey tubercles. Section showed a moderate number (over 100 in a great section), circular, with grey margins and opaque centres, varying in size, the larger not exceeding a $\frac{1}{16}$ in. in diameter.

Liver.—The liver on the surface showed a moderate number of pale grey tubercles of irregular shape. Some of them were $\frac{1}{8}$ to $\frac{1}{4}$ in. in diameter, and in places they were more or less confluent. Some were raised slightly, and had overhanging margins. All were very pale and translucent, and showed only very small central opacities. On section only a very few and very small grey tubercles were seen.

Hepatic Glands.—Were slightly enlarged, and had grey tubercles scattered in their cortices.

Kidneys.—Each showed a moderate number of small pale grey tubercles, just under the capsule.

Suprarenals.—Normal.

Renal Glands, Lumbar Glands, Iliac Glands.—Contained a moderate number of caseous tubercles.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Right Precrural.—Contained a moderate number of caseous tubercles.

Left Precrural.—In the left precrural gland were a good many large tubercles, almost of the size of small peas.

Pubic, Gluteal, Right Ischiatic, Popliteal.—Contained a moderate number of caseous tubercles.

Left Ischiatic Gland.—Normal.

Submaxillary, Parotideal, Post-Pharyngeal, Hyoid.—Contained caseous tubercles in moderate numbers, varying in size up to a small shot.

Tongue.—On the left side of the tongue was a small ulcer $\frac{1}{3}$ in. in diameter, with thickened margin.

Tonsils, Pharynx, Larynx.—Normal.

Eyes.—The right contained a tubercle in the choroid.

Microscopical Examination.

Tubercle from Right Eye
Ulcer from Tongue } No tubercle bacilli seen.

CALF 877. (Virus H 28. "C.L.")

Subcutaneous Inoculation of culture from Rabbit 102.

Dose—10 milligrammes.

Date—August 30th, 1905.

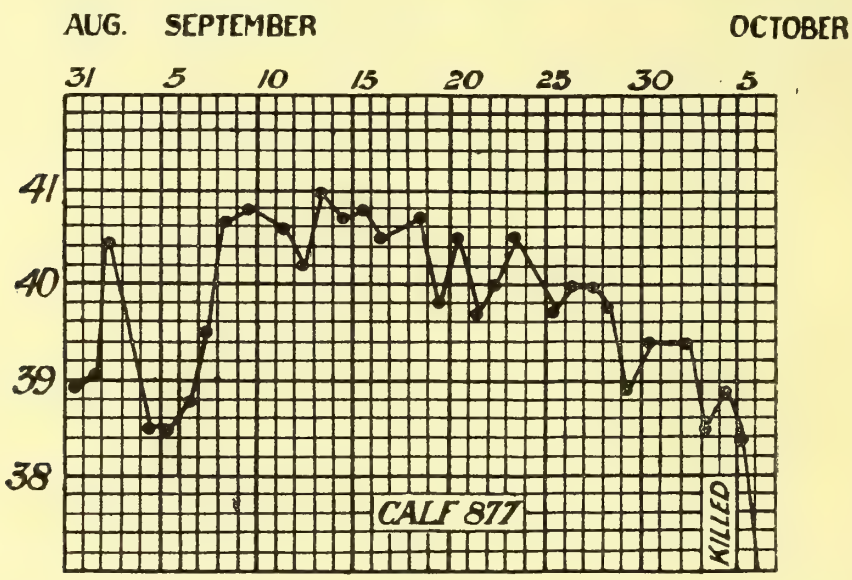
Weight at Inoculation—1 cwt. 0 qrs. 7 lbs.

Killed when dying—October 6th, 1905. [37 days after inoculation.]

Clinical Notes.

The calf was inoculated on August 30th, 1905. On October 6th, 37 days later, it was killed when in a dying condition.

Temperature.



Weights.

The calf lost nearly $\frac{1}{5}$ of its original weight during the experiment.

	cwt.	qrs.	lbs.	
August 30th, 1905 - - -	1	0	7	Inoculated.
October 6th, 1905 - - -	0	3	12	Killed when dying.

Total loss of weight during experiment.—23 lbs.

Average rate of loss per week.—4·3 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

Local Lesion.—At the seat of inoculation was a tumor which measured $5\frac{1}{2}$ in. by $3\frac{3}{4}$ in. by $1\frac{1}{2}$ in., and weighed 12 ozs. It was fibro-necrotic, and infiltrated the skin and subjacent muscle.

Right Prescapular Gland.—Was much enlarged; it measured $4\frac{1}{2}$ in. by $2\frac{1}{4}$ in. by $1\frac{1}{4}$ in., and weighed 6 ozs. It was caseo-necrotic throughout.

Left Prescapular Gland.—Contained a few small scattered tubercles.

Prepectoral Glands.—The prepectoral glands, two in number, were much enlarged (the larger to the size of a pigeon's egg), and similar in structure to the right prescapular.

Axillary Glands.—Contained a few small scattered tubercles.

Cervical Glands.—The deep cervical glands, three in number, were large and caseous.

Thorax.

Pleura.—The costal pleura contained a few small tubercles, arranged along the posterior borders of the middle ribs.

Lungs.—Were moderately enlarged. They weighed 4 lbs. 14 ozs. The anterior parts were reddened. The organ contained numerous small tubercles with irregular opaque centres. These tubercles formed grey prominences $\frac{1}{16}$ of an inch in diameter on the surface, a few being as large as $\frac{1}{8}$ of an inch. On section there was not so much congestion and consolidation about the groups of tubercles as is usually seen in fatal cases, and it seemed probable that in this case death was threatened principally by the state of the kidneys. (*Vide infra.*)

Trachea.—Normal.

Thoracic Glands.—Were enlarged, and their cortices composed of tubercular tissue, in which the opaque caseating spots predominated.

Heart.—The lining of the right ventricle showed two little irregular projecting bodies (?) tubercles in the conus arteriosus. No tubercles were visible in the termination of the vena cava superior, right auricle or elsewhere.

Abdomen.

Intestines.—In the small intestine four or five little solid tubercles, all but one in the terminal portion of the ileum, were all that could be found.

The cæcum also contained a few (three) similar bodies. The rest of the large intestine was normal.

Mesenteric Glands.—All contained a moderate number of tubercles, scattered throughout their cortices. They averaged in size about $\frac{1}{8}$ in., but a few were larger. They showed signs of early caseation at their centres.

Spleen.—Contained numerous rather small tubercles.

Liver.—Contained very numerous small well-defined tubercles, a few only of which projected on the surface, while many were seen dimly through a greater or lesser thickness of liver tissue.

Portal Glands.—Were slightly enlarged, and their cortices packed with opaque tubercles.

Kidneys.—Were much congested and distended, owing to the blocking of both ureters with gravel. They contained many minute and rather irregular-shaped tubercles in their cortices.

They were greatly enlarged, especially the right, and surrounded by œdematous tissue. The right ureter

was distended to about the size of one's finger, and when it was opened the urine spurted from it. A small collection of gravel was found obstructing it near the bladder, and a similar collection was found in the left one.

The right kidney, after the urine had escaped, measured $6\frac{1}{2}$ inches by $2\frac{1}{2}$ inches, and weighed 11 ounces. Its surface was mottled with dark purple patches—hæmorrhages. The rest of the cortex was rather pale, but the medulla was deeply congested. The calyces were distended.

The left kidney showed a few hæmorrhages. It was somewhat similar to the right, but less severely affected. In one of the calyces a small calculus was found.

There can be no doubt that the obstruction of the ureters was the main cause of the animal being in a dying condition.

Suprarenals.—Each contained one or two small tubercles.

Renal Glands, Lumbar Glands.—Packed with tubercles.

Iliac Glands.—Contained a moderate number of tubercles.

Genito-Urinary System.

Testes, Bladder.—Normal.

Special Glands.

Precrural.—Tubercles more numerous and larger in right than in left.

Pubic, Gluteal, Popliteal.—Contained a moderate number of tubercles.

Ischiatic.—Could not be found.

Submaxillary, Parotideal, Posterior Pharyngeal, Left Hyoid.—Each contained a moderate number of tubercles.

Right Hyoid (on the side of the inoculation).—Was enlarged, and contained a large caseous nodule.

Tonsils.—In each tonsil were several caseous tubercles.

Pharynx.—On the corrugated mucous membrane which descends from the nasal septum on to the dorsal wall of the pharynx were a few irregular caseous tubercles.

Larynx.—Normal.

Eyes.—Normal.

Microscopical Examination.

Tubercle from Heart.—Tubercle bacilli few.

Tubercle from Kidney.—Tubercle bacilli.

CALF 819. (Virus H 28. "C.L.")

Subcutaneous Inoculation of culture derived from Rabbit 102.

Dose—10 milligrammes.

Date—August 30th, 1905.

Weight at Inoculation—1 cwt. 0 qrs. 11 lbs.

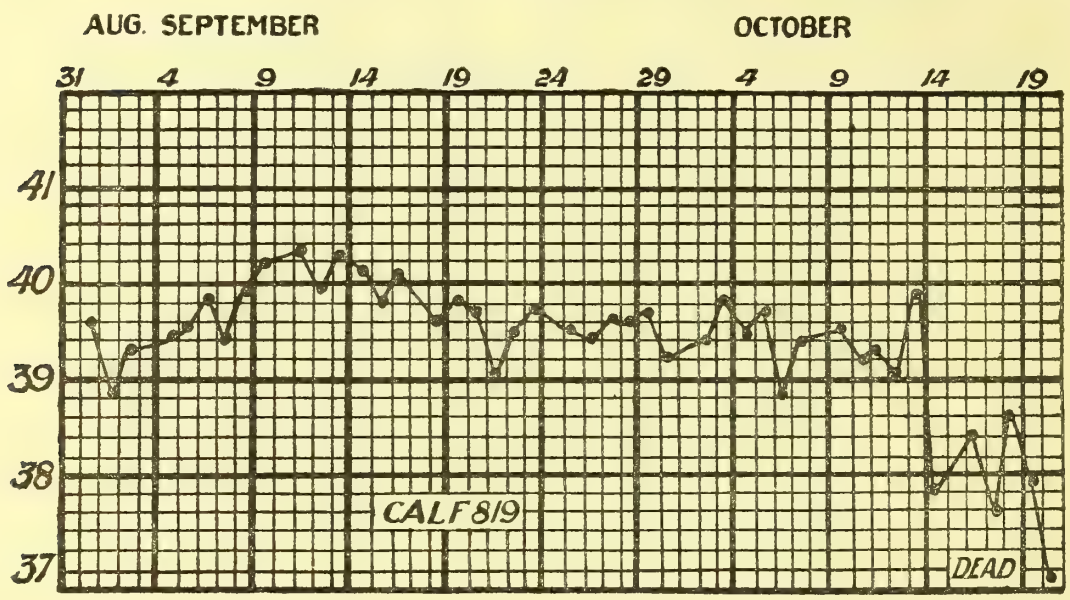
Died—October 21st, 1905. [52 days after inoculation.]

Clinical Notes.

The calf was inoculated on August 30th, 1905. It died on October 21st, 52 days later.

The course of the disease was similar to that usually seen in calves suffering from acute tuberculosis.

Temperature.



Weights.

The calf lost nearly one-fifth of its original weight during the experiment.

	cwt.	qrs.	lbs.	
August 30th, 1905 - -	1	0	11	Inoculated.
October 21st, 1905 - -	–	3	17	Died.

Total loss of weight during experiment.—22 lbs.

Average rate of loss per week.—3 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Thin.

Local Lesion.—The tumour at the seat of inoculation measured 5¾ in. by 4¾ in. by 2 in., and weighed 2 lbs. 2 ozs. It was solid, firm, and necrotic, and widely infiltrated the skin and subjacent muscle.

Right Prescapular Gland.—Was enlarged. It measured 3½ in. by 2 in. by 2 in., and weighed 5 ozs. It was caseo-necrotic throughout.

Left Prescapular Gland.—Contained several large caseating tubercles.

Prepectoral Glands.—The right prepectoral gland was as large as a cherry, and of similar consistency to the right prescapular gland.

Axillary Glands.—The right was large, and its cortex entirely fibro-caseous. The left was normal.

Thorax.

Pleura.—Along the margins of many of the ribs the pleural villi were red and hypertrophied. Here and there they could be seen to spring from little yellow tubercles.

Lungs.—Were very large and heavy, and weighed 8 lbs. 3 ozs. Their surfaces were everywhere of a dark purple colour, except when larger projecting tubercles formed paler islands. Section showed the interlobular connective tissue to be greatly swollen by blood-stained œdema, some of the spaces being as much as ⅛th of an inch wide. The lungs were very full of blood, which ran out on section. The lung tissue was fairly thickly packed with large pea-sized very irregular tubercles with ramifying caseating centres. Here and there these had become confluent. The still crepitant tissue was bright red in colour, and formed a strong contrast to the dark purple interlobular spaces.

Trachea.—Several small tubercles were seen in the trachea.

Thoracic Glands.—Were much enlarged. The large posterior thoracic measured 5 in. by 2 in. by 1½ in. All together weighed 8 ozs., and they were firm and caseo-necrotic.

Pericardium.—On the pleural surface of the pericardium were some elongated flattened fleshy tuberculous growths.

Heart.—There were a few small translucent tubercles in the intima of the right auricle.

Abdomen.

Peritoneum, Omentum.—On the omentum the villi were congested and hypertrophied, and formed here and there red velvety patches. A few lobulated caseating tubercles were loosely attached in places.

Intestines.—The small intestine contained a good many yellow caseating foci in the Peyer's patches. The largest of these were ⅛ or ⅙ of an inch in diameter, and one or two were commencing to ulcerate.

In the first part of the large intestine were seen reddish spots, superficially ulcerated, probably of tuberculous origin.

Mesenteric Glands.—Were enlarged. All the glands contained numerous caseating foci, or where these had become confluent there were caseous nodules in the cortex.

Spleen.—Was large and nodular. Section showed it almost completely composed of large pea-sized tubercles with large irregular caseous centres and greyish pink firm margins. They were thickly crowded together with very little spleen pulp between them.

Liver.—Was thickly packed with minute yellow tubercles, and here and there a few larger ones. On the surface, besides innumerable little tubercles, were some more superficial and larger flattened tubercles, some of them being $\frac{1}{8}$ or $\frac{1}{16}$ of an inch in diameter. The more superficial had overhanging margins.

Portal Glands.—Were enlarged, and their cortices were packed with large caseating tubercles.

Kidneys.—There were a few yellow tubercles about $\frac{1}{16}$ of an inch in diameter in the cortex of each.

Suprarenals.—Two caseous tubercles were seen in the right and three smaller ones in the left.

Renal Glands, Lumbar Glands.—Resembled the right axillary, but were rather more advanced.

Iliac Glands.—Contained several large caseating tubercles.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Popliteal.—Contained several large caseous tubercles.

Ischiatic.—Normal.

Submaxillary, Parotideal, Post-Pharyngeal, Hyoid.—Contained large caseous tubercles.

Tongue.—Normal.

Tonsils.—Several rather large caseous tubercles were seen in each tonsil.

Pharynx.—One or two small tubercles were seen in the pharyngeal mucous membrane.

CALF 875. (Virus H 28. "C.L.")

Subcutaneous Inoculation of culture derived from Rabbit 102.

Dose—10 milligrammes.

Date—August 30th, 1905.

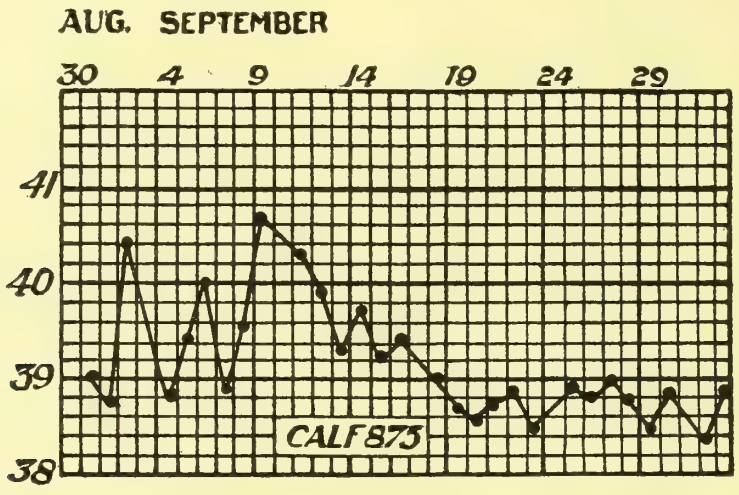
Weight at Inoculation—1 cwt. 0 qrs. 23 lbs.

Killed—November 29th, 1905. [91 days after inoculation.]

Clinica Notes.

The calf was inoculated on August 30th, 1905. Except for a slight constitutional disturbance at the commencement of the experiment, the animal remained well, and was in good condition when killed on November 29th, 1905, 91 days after inoculation.

Temperature.



From October 3rd to November 29th, when the calf was killed (a period of 8 weeks), the temperature remained normal.

Weights.

The gain of weight (4·4 lbs. per week) was but little below the average for healthy calves.

	cwt.	qrs.	lbs.	
August 30th, 1905 - -	1	0	23	Inoculated.
November 29th, 1905 - -	1	2	24	Killed.

Total gain of weight during experiment.—2 qrs. 1 lbs.

Average rate of gain per week.—4·4 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a small prominent swelling, which measured 3 in. by 2¼ in. by 1 in., and weighed 3 ozs. It consisted of one small salmon pink fibro-necrotic mass, adherent to dead fibrous tissue beneath, and to greatly thickened skin, which was, however, very thin at the centre.

Right Prescapular Gland.—Was moderately enlarged. It measured 2¾ in. by 1½ in. by ¾ in., and weighed 1 oz. It contained large dense caseo-necrotic salmon pink masses, with calcareous grains at their outer parts. The greater part of the gland was occupied by these caseo-calcareous masses, but the rest was brown and soft.

Left Prescapular Gland.—Normal.

Right Prepectoral Gland.—Was the size of a very small pea. It contained a small crescent-shaped calcareous patch.

Axillary Glands.—Normal.

Thorax.

Pleura.—Normal.

Lungs.—Appeared at first sight normal, but close inspection revealed a few of the little grey translucent bodies, some with minute opaque centres, which have been frequently seen in calves injected with non-virulent viruses. They were not calcareous. One was seen on section.

Thoracic Glands.—Were normal in size, but contained little scattered caseous foci in the cortex, which were rather numerous in the left bronchial.

Heart.—Normal.

Abdomen.

Peritoneum, Intestines, Mesenteric Glands.—Normal.

Spleen.—The spleen showed seven or eight yellow tubercles of rather small size in a large section.

Liver, Hepatic Glands, Kidneys, Suprarenals.—Normal.

Renal Glands, Lumbar Glands.—Contained little caseous foci scattered in the cortex.

Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Right Popliteal.—Normal.

Left Popliteal.—Contained a single focus.

Submaxillary, Parotideal, Posterior Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

VIRUS H 29. "M.F."

CERVICAL GLAND. (Operation.)

TABLE 29.

VIRUS H 29. "M.F"

CERVICAL GLANDS.

April 29, 1904.

GUINEA-PIGS. (1st series.)

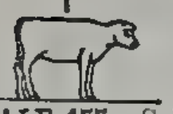
1224	Killed	69 days	G.T.
1225	„	69 „	G.T.
1226	„	64 „	G.T.
1227	„	64 „	G.T.

July 2, 1904.

GUINEA-PIGS. (2nd series.)

1328	Killed	28 days	G.T.
1329	„	28 „	G.T.

July 30, 1904.
E. of Lesions of G.P.'s 1328–1329.



COW-CALF 477. Subcut.
Dose : 3,020,400,000 T.B.
Killed when very ill, September 2, 1904.
34 days
P.M.—General tuberculosis, severe.

GUINEA-PIGS.

1344	Died	16 days	Tuberculous peritonitis.	S.
1345	„	56 „	G.T.	

RABBITS.

115	Killed	54 days	G.T.	V.
116	Died	16 „	Tuberculosis of lungs.	



BULL-CALF 479. Subcut
Dose : 3,020,400,000 T.B.
Killed when dying, August 31, 1904,
32 days.
P.M.—General tuberculosis, severe.

September 1, 1904.

E. of prescapular, prepectoral and cervical glands.



HEIFER 251. Subcut.
Dose : 2,844,400,000 T.B.
Killed : January 17, 1905.
138 days.
P.M.—Small local abscess. Calcareous foci in prescapular and bronchial glands. One tubercle in heart. Tuberculosis of uterus and mammary gland. (G.T. slight.)



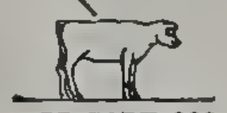
BULL-CALF 483. Subcut.
Dose : 355,550,000 T.B.
Killed : December 15, 1904.
105 days.
P.M.—Local lesion and nearest glands caseous and calcareous. About 30 pea-sized nodules in lungs; 12 in spleen. Caseo-calcareous nodules in thoracic glands (G.T. slight.)



BULL-CALF 501. Subcut.
Dose : 10,000,000 T.B.
Killed : December 14, 1904.
104 days.
P.M.—Small local lesion. Small calcareous tubercles in lungs, liver, spleen. Calcareous foci in thoracic, hepatic, and pharyngeal glands. (G.T. slight.)



BULL-CALF 463. Subcut.
Dose : 1,000,000 T.B.
Killed : December 15, 1904.
105 days.
P.M.—Minimal local lesion. Glands on both sides contain caseo-calcareous nodules. A left pectoral was caseo-necrotic throughout. Very few minute tubercles in lungs; some pea-sized tubercles in spleen. (G.T. slight.)



BULL-CALF 663.
Born of H. 251, January 8, 1905.
Killed 2 days later, January 10, 1905.
P.M.—Numerous early caseating foci in hepatic glands. Few early tubercles in lungs, liver, spleen, kidney, thoracic and lumbar glands.

GUINEA-PIGS.

E. of hepatic glands	1460	Died	22 days	G.T.
	1461	„	19 „	Tuberculous peritonitis.
E. of liver	1462	„	18 „	

TABLE 29A.

VIRUS H 29. "M.F."

CERVICAL GLANDS.

CULTURE INOCULATIONS.

[I.] March 25, 1905.

Strain derived from human cervical glands, through G.P. 1329.
Total duration of artificial cultivation, 8 months.
9th culture used for injection, 22 days old, on pure serum.



BULL-CALF 693.
Subcutaneous.
Dose: 50 milligrammes.
Died, May 26, 1905.
63 days.
General tuberculosis, severe.



BULL-CALF 697.
Subcutaneous.
Dose: 50 milligrammes.
Killed when dying, April 29, 1905.
55 days.
General tuberculosis, severe.

RABBITS.

315	1· mg.	Died, 22 days	G.T.
316	0·1 „	„ 30 „	„
317	0·01 „	„ 91 „	„

RAT. [P.

35	50 mg.	Died, 67 days	General dissemination of tubercle bacilli.

[II.] July 5, 1905.

Strain as above.
Total duration of artificial cultivation, 11 months.
13th subculture on pure serum used for injection, 21 days old.



BULL-CALF 841.
Subcutaneous.
Dose: 50 milligrammes.
Died, July 28, 1905.
23 days.
General tuberculosis, moderate.



BULL-CALF 847.
Subcutaneous.
Dose: 50 milligrammes.
Killed when ill, August 5, 1905.
31 days.
General tuberculosis, severe



BULL-CALF 835.
Subcutaneous.
Dose: 10 milligrammes.
Died, August 14, 1905.
40 days.
General tuberculosis, severe.



BULL-CALF 839.
Subcutaneous.
Dose: 10 milligrammes.
Killed when dying, September 12, 1905. 69 days.
General tuberculosis, severe.

RABBITS.

513	10 mg.	Died, 11 days	G.T.
514	1· „	„ 15 „	„
515	0·1 „	„ 52 „	„
516	0·01 „	„ 17 „	Slight tuberculous peritonitis. Death from other causes.

GUINEA-PIGS.

1599	1 mg.	Died, 17 days	G.T.
1600	1· „	„ 12 „	Early G.T.
1601	0·1 „	„ 16 „	G.T.
1602	0·1 „	„ 28 „	„

RAT. [P].

41	100 mg.	Died, 85 days	General dissemination of tubercle bacilli.

VIRUS H 29. "M.F."

M.F., a Female Child, aged seven and a half years, admitted to Hospital, April 26th, 1904, suffering from Enlarged Cervical Glands. Operation April 29th, 1904.

Family History.—There was no history of tuberculosis on either the maternal or paternal side. The child was nursed by her mother for about eight months, and then fed on artificial food and cows' milk. One brother suffered as a child from rickets, but is now said to be in good health.

Clinical History.—Swellings were noticed in the neck fifteen months before admission, and had been gradually increasing in size. There had been no pain or discomfort. On examination there were large, rather fixed, glands at the upper end of the anterior and posterior triangles on the right side of the neck.

The glands were removed by operation on April 29th, and were breaking down when excised. The wound had healed when the patient was discharged a week later.

Subsequent History.—The child was visited at home six months after the operation. The wound on the right side of the neck was perfectly healthy. One or two small glands could be felt behind the scar, and one small gland on the left side of the neck. No enlarged glands could be detected on the axillae or groins. The child was reported to be very much better since the operation. She had not been under the care of any medical man since she left the hospital, and no further treatment was desired.

A month later, by request, the child was examined medically, and was reported to have no glandular enlargement, and no signs or symptoms of pulmonary or other disease.

DESCRIPTION OF MATERIAL RECEIVED AT BLYTHWOOD FARM.

A Cervical Gland removed by operation. The gland measured 2 in. by 1 in. and contained a multilocular abscess, filled with purulent and caseating contents, in a smear from which several tubercle bacilli were found.

COW-CALF 477. (Virus H 29. "M.F.")

Subcutaneous Inoculation of emulsion of lesions from Guinea-pigs 1328–1329.

Dose—3,020,400,000 T.B. (Vol. 20 c.c. E=151,020,000 T.B. per c.c.]

Date—July 30th, 1904.

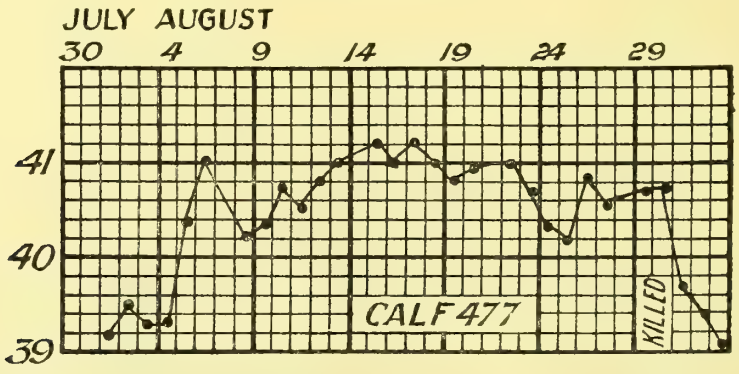
Weight at Inoculation—1 cwt. 2 qrs. 15 lbs. [Age about 19 weeks.]

Killed—When very ill, September 2nd, 1904. [34 days after inoculation.]

Clinical Notes.

In a few days a swelling appeared at the seat of inoculation, which by August 23rd had extended into the dewlap and measured 8 in. by 11 in. The prescapular gland was 5 in. in length. The coat was staring, the respiration rapid, and the animal obviously very ill. It was killed, when dying, on September 2nd (thirty-four days after inoculation).

Temperature.



Weights.

	cwts.	qrs.	lbs.
July 30th, 1904	1	2	15
September 2nd, 1904	1	1	5

Total loss of weight—1 qr. 10 lbs.

The animal gained 4 lbs. in weight during the first fortnight of the experiment. It rapidly lost in weight during the remaining sixteen days, losing 8 lbs. during the two days previous to its death. The average rate of loss per week was 6·3 lbs.

Tuberculin Test.

This animal was not tested before death.

POST-MORTEM EXAMINATION.

General Condition.—Very thin.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a large flattened tumour, over which the skin was cracked and scaly. It was found to infiltrate both the skin over it and the muscle below. It was composed of the usual caseo-necrotic salmon-pink mass, containing little cavities full of serum, between the skin infiltrated with little tubercles, and the subjacent muscle packed with caseating nodules. There was a good deal of œdema around the lower part of the tumour.

Right Prescapular Gland.—Was very large. It measured 5½ in. by 2½ in. by 2¾ in., and weighed 10 ozs. It was composed almost entirely of yellowish-grey caseo-necrotic tissue containing little brighter opaque points, and here and there arranged as a meshwork, containing little islands of a pink, more translucent tissue.

Left Prescapular Gland.—Was greatly enlarged, and contained a large caseating nodule 1 in. in diameter, as well as several smaller ones.

Prepectoral Glands.—Two prepectoral glands were as large as pigeon's eggs and caseo-necrotic throughout.

Axillary Glands.—Were packed more or less with rather large flabby tubercles, nearly ⅛ in. in diameter.

Cervical Glands.—A deep cervical gland, situated about the middle of the neck, was a large as a pigeon's egg. This, with two smaller ones, were similar in structure to the right prescapular gland.

Thorax.

Pleura.—On the pleura was a tubercle, lenticular in shape (⅛ in.), and loosely attached to each tenth rib. Several tubercles were found in the mediastinal and vena caval folds of pleura, as well as several small tuberculous glands.

Lungs.—Were everywhere packed almost as closely as possible with little grey tubercles, which projected on the surface of the anterior and inferior parts. These latter were dark pink in colour, collapsed and almost entirely airless. The bronchi were filled with froth.

Thoracic Glands.—The bronchial and mediastinal glands were enlarged, and together weighed 7 ozs. The posterior thoracic measured 5 in. by 2 in. by ¾ in. The medulla was soft and pink, its cortex firm, and composed of greyish-yellow caseo-necrotic tissue. The other thoracic glands were similarly affected.

There was a group of small tuberculous glands lying in the fat in the angle between the diaphragm and the sternum.

Pericardium.—There were several tubercles on the pleural surface of the pericardium.

Heart.—Two small tubercles were found in the right auricle, just under the endocardium.

Abdomen.

Omentum.—The omentum had several lenticular tubercles (⅛ in.) loosely attached to it.

Intestines.—The small intestine contained many small points of pultaceous matter, which did not resemble tubercles.

The large and small intestine contained several suspicious looking foci. (See microscopic examination.)

Mesenteric Glands.—Were more or less packed with rather large flabby tubercles, nearly ⅛ in. in diameter.

Spleen.—Contained numerous tubercles, rather less regular in shape than those seen in more chronic cases.

Liver.—Was larger than normal, pinkish and pale. It was covered with very numerous tubercles, the largest scarcely ⅛ in. in diameter, the majority much smaller. Some were distinctly raised and flattened on the surface. Section showed them very thickly scattered throughout the organ.

Portal Glands.—Were enlarged, and more or less packed with rather large fleshy tubercles, nearly $\frac{1}{8}$ in. in diameter.

Kidneys.—Each contained many small round tubercles, both on the surface and scattered throughout the organ. On the surface from three to a dozen could be counted in each lobule.

Suprarenals.—The left suprarenal contained two small tubercles.

Renal Glands.—Were enlarged, and more or less packed with rather large fleshy tubercles, nearly $\frac{1}{8}$ in. in diameter.

Cœliac Glands, Lumbar Glands, Iliac Glands.—Were more or less packed with rather large fleshy tubercles, nearly $\frac{1}{8}$ in. in diameter.

Genito-Urinary System.

Uterus.—Was not examined.

Mammary Gland.—Was a little swollen, and parts were rather firmer and redder in colour than usual. Several hard fleshy tubercles were found in it, and one of them was examined by the microscope, and found to be very full of tubercle bacilli.

Supramammary Glands.—Contained numerous tubercles.

Special Glands.

Gluteal, Ischiatic, Popliteal.—Were found to be more or less packed with rather large fleshy tubercles, nearly $\frac{1}{8}$ in. in diameter.

Submaxillary, Parotideal, Post-Pharyngeal, Hyoid.—Resembled the gluteal and popliteal.

Many hæmo-lymph glands were found to contain tubercles.

The mucous membrane of the posterior part of the nasal cavities, and that covering the nasal septum and the dorsal wall of the pharynx, the tonsils and the lining of the trachea, contained a good many little prominent yellow tubercles. The larynx itself was normal.

Thyroid.—Contained one doubtful speck.

Thymus.—Was small, and appeared much atrophied.

Microscopical Examination.

Tubercle from Right Auricle of Heart.—Tubercle bacilli.

Tubercle fromPharynx.—Tubercle bacilli.

Tubercle from Tonsil.—Tubercle b cilli.

Tubercle from Trachea.—Tubercle bacilli.

Tubercle from Thyroid.—Two tubercle bacilli seen.

Tubercle from Suprarenal.—Tubercle bacilli.

Yellow Spot from Small Intestine.—No tubercle bacilli.

Scraping from apparently Normal Part of Intestine.—No tubercle bacilli.

Suspicious-looking Follicle from Large Intestine.—Tubercle bacilli.

Suspicious-looking Follicle from Small Intestine.—Tubercle bacilli.

Mammary Gland.—Tubercle bacilli.

CALF 479. (Virus H 29. "M.F.")

Subcutaneous Inoculation of emulsion of lesions from Guinea-pigs 1328-1329.

Dose—3,020,000,000 T.B.

Date—July 30th, 1904.

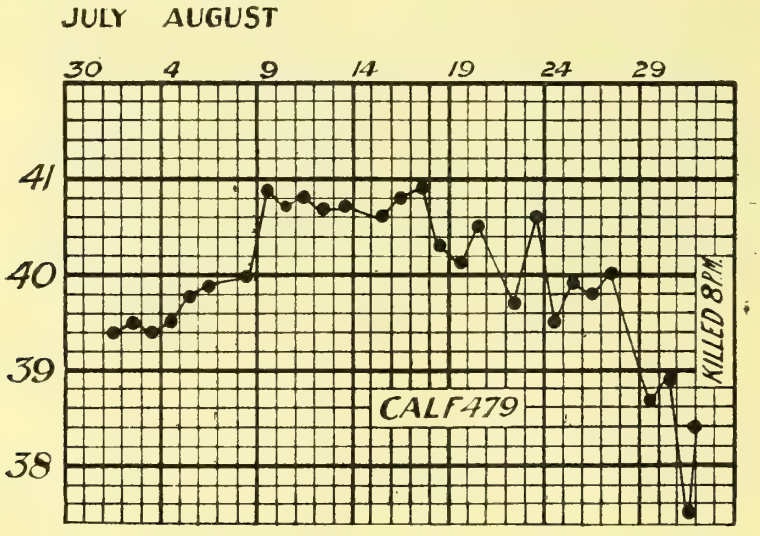
Weight at Inoculation—1 cwt. 0 qrs. 16 lbs.

Killed—When dying, August 31st, 1904. [32 days after inoculation.]

Clinical Notes.

In the course of a few days a swelling appeared at the seat of inoculation, and steadily increased in size. On August 23rd it measured 9 in. by 10 in., including the prescapular gland, and extended from the angle of the jaw to the shoulder, and down as far as the bottom of the dewlap. The prescapular gland alone was 6 in. in length. The animal was obviously ill. It was killed on August 31st, when very ill and apparently dying, 32 days after inoculation.

Temperature.



Weights.

	cwt.	qrs.	lbs.
July 30th, 1904 - - - - -	1	0	16
August 31st, 1904 - - - - -	0	3	22

Total loss of weight.—22 lbs.

The animal steadily lost weight during the course of the experiment, the loss during the fortnight before death amounting to 20 lbs. The average rate of loss per week was 5·0 lbs.

Tuberculin Test.

This animal was not tested before death.

POST-MORTEM EXAMINATION.

General Condition.—Very thin.

Seat of Inoculation.—At the seat of inoculation, on the right side of the neck, was a large flat tumour, measureing 9 in. by 6 in., and about 3 in. in thickness. It weighed 2 lbs. 10 ozs. The skin was adherent to it, but was not itself infiltrated, but the subjacent muscles were largely infiltrated, and so was the œdematous tissue below the tumour, so that it was difficult to define its exact extent. Between the infiltrated muscle and the skin the tumour consisted of the usual firm and tough salmon-pink caseo-necrotic tissue.

Right Prescapular Gland.—Was much enlarged and hard. It measured 4½ in. by 2½ in. by 2¼ in., and weighed 8 ozs. It was composed chiefly of firm tough salmon-pink caseo-necrotic tissue, but in parts it was softer, and individual tubercles could be seen, not yet confluent.

Left Prescapular Gland.—Was large and œdematous, and contained a few tubercles.

Prepectoral Glands.—The right prepectoral gland was as large as a horse chestnut, and caseo-necrotic throughout. The left was enlarged and packed with small tubercles.

Cervical Glands.—A deep cervical gland near the root of the neck, on the right side, was nearly as large as the right prepectoral gland, and like it was in the more advanced stage mentioned above. Another deep cervical or hyoid gland, at the anterior end of the neck, 1⅓ in. by 1½ in. by 1 in., was similarly affected.

Pectoral Glands.—Two large pectoral glands on the right side were similar in structure to the softer part of the right prescapular. The pectoral glands on the left side were enlarged and packed with small tubercles.

Axillary Glands.—Contained several minute grey tubercles.

Thorax.

Pleura.—Normal.

Lungs.—Several large irregular areas in the thin anterior lobes were dark pink and collapsed. Smaller irregular masses of collapse were seen elsewhere on the surface, and on section through the thicker posterior lobes. The collapsed areas could be seen to be fairly thickly studded with little pearly-grey tubercles, the largest of which just reached the size of a pin's head. Similar tubercles could be seen in the collapsed part on section. In the other parts of the lung the tubercles were less easily seen, and differed but slightly in colour from the lung itself, but they were scarcely less numerous here than in the collapsed parts. They could be felt by the finger as easily as seen.

Thoracic Glands.—Were only very slightly swollen. They contained small early grey tubercles in little groups, little, if any, more numerous than those in other glands throughout the body.

A large gland just within the thorax, which measured 2¼ in. by 1¼ in. by 1⅛ in., was solid, and crammed with little tubercles, which in places were becoming confluent, and tended to form large caseo-necrotic areas.

Heart.—Was flabby. The fat in the auriculo-ventricular groove was yellower than normal, and looked as if most of it had been removed, and replaced by œdema fluid.

Abdomen.

Peritoneum, Omentum, Intestines.—Normal.

Mesenteric Glands.—Contained occasional small tubercles.

Spleen.—Appeared almost normal on section, but it was noticed that the Malpighian bodies were harder than normal, and very readily shelled out on the point of a knife. One of these, when crushed, was found to be full of tubercle bacilli.

Liver.—Was thickly covered with minute pearly-grey tubercles, a few of which were on the surface and distinctly raised. These reached the size of a pin's head. The others were smaller, and were more or less dimly seen according to the depth beneath the capsule. Section showed the tubercles scattered thickly throughout the organ.

Portal Glands.—These glands, like the thoracic, contained groups of small grey tubercles.

Kidneys.—Each contained about ten or a dozen very small pearly-grey tubercles. The largest of these were composed of a number of little pale points which penetrated as a wedge into the cortex, and could be clearly seen to be infarcts.

Suprarenals.—There was a suspicious point in one of the suprarenals.

Renal Glands, Lumbar Glands, Iliac Glands.—All contained several minute grey tubercles or groups of tubercles.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Posterior Pharyngeal.—All contained several minute grey tubercles or groups of tubercles.

Tongue, Pharynx, Tonsils.—Normal.

Microscopical Examination.

Patch of little white points on the Endocardium of the Right Ventricle.—No tubercle bacilli seen.

Suspicious Point in one of the Suprarenals.—No tubercle bacilli seen.

Yellow Point from Small Intestine. — No tubercle bacilli seen.

Bone Marrow.—No tubercle bacilli seen.

Malpighian Body from Spleen.—Tubercle bacilli rather numerous.

Emulsion of Prescapular, Prepectoral, and Deep Cervical Glands.—Tubercle bacilli.

HEIFER 251. (Virus H 29. "M.F.")

Subcutaneous Inoculation of emulsion of prescapular and prepectoral glands from Calf 479.

Dose—2,844,400,000 T.B. [Vol. : 20 c.c. E = 142,220,000 T.B. per c.c.]

Date—September 1st, 1904.

Weight at Inoculation—5 cwt. 2 qrs. 3 lbs.

Killed—January 17th, 1905. [138 days after inoculation.]

Clinical Notes.

On September 26th there was a swelling at the seat of inoculation, which measured 3½ in. by 4 in., and the prescapular gland on the same side was 5 in. in length. The animal, however, showed no sign of illness.

By October 11th the swelling at the seat of inoculation had slightly decreased in size, and the prescapular gland was still larger than normal.

On January 8th, 1905, the heifer gave birth to a bull calf, which was killed two days later.

The animal was killed on January 17th, 1905, having exhibited no symptoms of illness throughout the course of the experiment.

Temperature.

The temperature remained normal throughout the experiment.

Weights.

	cwts.	qrs.	lbs.
September 1st, 1904 - - - -	5	2	3
January 17th, 1905 - - - -	6	2	17

Total gain of weight.—1 cwt. 0 qrs. 14 lbs.

The animal gained steadily in weight up to January 8th, 1905, the date on which her calf was born. During the 9 days following she lost 123 lbs.

Tuberculin Test.

The animal was not tested before death.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a small pear-shaped tumour, easily separable from the skin and subjacent muscle, and measuring 3 in. by 2 in. by 1½ in. It was entirely filled with pultaceous caseous matter, contained in an abscess cavity with thin fibrous walls.

Right Prescapular Gland.—Was slightly enlarged; scattered rather sparsely throughout it were calcareous grains, sometimes arranged in groups up to ⅛ in. in diameter.

Left Prescapular Gland, Prepectoral Glands, Axillary Glands.—Normal.

Thorax.

Pleura.—Normal.

Lungs.—The lungs in general appearance were healthy. The fringes along the borders of the anterior lobes were more developed than usual, but no trace of tubercle could be found in them. In the left lung, close to its root, was found a spherical tubercle as large as a small pea, which readily shelled out. No trace of tubercle could be found elsewhere.

Thoracic Glands.—Were not enlarged. In both left and right bronchial were found several minute calcareous grains, arranged in a line about $\frac{1}{16}$ in. below the surface. In the posterior thoracic glands some similar points were made out with difficulty.

Heart.—On the ventral surface of the left ventricle was a little yellow point just beneath the surface, which when picked out and spread upon a coverslip appeared to be caseous. The heart was otherwise normal.

Abdomen.

Peritoneum, Omentum, Intestines, Mesenteric Glands, Spleen, Liver.—Normal.

Kidneys, Suprarenals, Renal Glands, Lumbar Glands.—Normal.

Iliac Glands.—The left was slightly larger than the right, but normal in appearance. The right was normal.

Genito-Urinary System.

Uterus.—The uterus was somewhat distended with blood-stained discharge. The cotyledons were large, and covered with a soft, yellow layer, which appeared to be separating, and could be easily scraped off. One of these cotyledons, cut across, revealed some purulent discharge oozing out from the meshwork of atrophying vessels at its base. In several places between the cotyledons the mucous membrane showed numerous yellow points. Some of these, when cut, appeared to be little deposits of pus, but others were solid, and slightly raised. These varied in size up to ⅛ in.

Mamma.—In the left fore quarter a caseous mass was found, 1 in. in diameter, partly salmon pink and partly yellow, divided into several lobules, and enclosed in a fibrous capsule. The other quarters of the udder were normal.

Supramammary Glands.—Normal.

Special Glands.

Precrural.—The left precrural gland contained two caseous tubercles. The right was normal.

Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

Microscopical Examination.

Uterus :

1. *Pus from Base of Cotyledon.*—Tubercle bacilli very numerous.

2. *Pus from Mucous Membrane between the Cotyledons.*—Tubercle bacilli. Six seen in one bunch; a few others.

3. *Solid Yellow Tubercle.*—Tubercle bacilli fairly numerous (seventeen counted).

(b) *The Smaller Horn.*

1. *Yellow Tubercle.*—Tubercle bacilli.

2. *Pus from Focus in Mucous Membrane.*—Tubercle bacilli numerous.

Caseous Tumour from Mammary Gland. 1. No tubercle bacilli seen. 2. Few tubercle bacilli.

Left Precrural Gland (tubercle from).—Tubercle bacilli.

Heart (Caseous Focus from)—No tubercle bacilli.

Lung (tubercle from).—Tubercle bacilli fairly numerous.

BULL-CALF 663. Virus H 29. "M.F."

Born—of Heifer 251 on January 8th, 1905, four months after her inoculation with Virus H 29. "M.F."

Weight—2 qrs. 9 lbs.

Killed—January 10th, 1905. [2 days after birth.]

POST-MORTEM EXAMINATION.

The calf was strong and big.

Hepatic Glands.—Were slightly enlarged, and contained numerous yellow points in an early stage of caseation.

Liver.—On the surface of the liver could be seen about four small translucent grey tubercles smaller than a pin's head. There was also a little tuberculous nodule about the size of a pea, packed with little yellow points.

Spleen.—In the spleen were about six grey tubercles about the size of a No. 1 shot. They were not like the tubercles commonly seen in the spleen, being irregular in shape, translucent, and with little or no sign of caseation.

Kidneys.—On the right kidney there was a single grey spot (tubercle) the size of a pin's head.

Suprarenals.—Normal.

Lungs.—In the left lung was a small rectilinear area ($\frac{1}{8}$ in.), dark red and translucent, containing a small pinhead tubercle in an early stage of caseation.

In the posterior corner of this lung something hard was felt beneath the surface, and this on section was found to be a red translucent nodule of the size of a pea, containing caseating foci. In the corresponding position in the right lung a small tubercle was found.

Thoracic Glands.—In the posterior thoracic gland were found a yellow nodule about the size of a small shot in an early state of caseation, and one or two small foci.

In the bronchial glands some similar foci were seen.

Pleura, Omentum, Peritoneum.—Normal.

Tongue, Pharynx, Palate, Tonsils.—Normal.

Pharyngeal and Hyoid Lymphatic Glands.—Normal.

Submaxillary and Parotideal Lymphatic Glands.—Normal.

Intestines, Mesenteric Glands.—Normal.

Various Lymphatic Glands.

Prescapular, Axillary, Precrural, Popliteal, Iliac.—Normal.

Lumbar.—One was normal. In another (a renal gland ?) a small focus was seen.

Microscopical Examination.

Hepatic Gland.—Tubercle bacilli. Thirteen counted.
Hepatic Glands (Emulsion of).—Tubercle bacilli.
Liver (*Focus from*).—No tubercle bacilli seen.
Liver (Emulsion of).—Tubercle bacilli.
Lung.—Tubercle bacilli. Five seen.
Spleen.—Tubercle bacilli fairly numerous.
Kidney (*Grey Focus from*).—No tubercle bacilli seen.
Posterior Thoracic Gland.—Tubercle bacilli.

BULL-CALF 483. (Virus H 29. "M.F.")

Subcutaneous Inoculation of emulsion of prescapular and prepectoral glands from Calf 479.

Dose—355,550,000,T.B. [Vol.: 2·5 c.c. of emulsion. E = 142,220,000 T.B. per c.c.]

Date—September 1st, 1904.

Weight at Inoculation—1 cwt. 1 qr. 18 lbs.

Killed—December 15th, 1904. [105 days after inoculation.]

Clinical Notes.

By September 26th a swelling had developed at the seat of inoculation, measuring 5½ in. by 4 in. The prescapular gland on the same side was 4 in. in length, and a smaller spherical gland could be felt, about 2 in. in diameter, lying superficially to it. The animal appeared to be in good health.

On October 11th the swelling had decreased in size, and was becoming flaccid. The prescapular gland measured 3½ in., and the superficial one mentioned above was the size of a horse chestnut.

On October 25th the swelling was slightly larger and flaccid.

The animal was killed on December 15th, in apparently good health.

Temperature.

The temperature rose on the thirteenth day to slightly over 40°, having been normal till then. It was afterwards approximately normal till the animal was killed.

Weights.

	cwt.	qrs.	lbs.
September 1st, 1904 - - - -	1	1	18
December 15th, 1904 - - - -	2	2	3

Total gain of weight.—1 cwt. 0 qrs. 13 lbs.

The animal steadily increased in weight throughout the course of the experiment, the average gain per week being 8·3 lbs.

Tuberculin Test.

This animal was not tested before death.

POST-MORTEM EXAMINATION.

General Condition.—Fat.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a tumour which measured 5 in. by 3 in., and was about 1 in. in thickness. It scarcely infiltrated the skin, and to a slight extent only the subjacent muscle, and consisted of a collection of softened caseous matter enclosed in a cavity, whose thick walls were fibrous and infiltrated with caseo-calcareous deposit.

Right Prescapular Gland.—Was enlarged, and measured 3¼ in. by 1¾ in. by 1¼ in. The superficial part of its cortex, ¼ in. thick, was infiltrated with calcareous grains. Within this were two large tuberculous nodules, translucent and fibrous in their peripheral part, which enclosed a salmon-pink mass of caseo-necrotic tissue, the peripheral parts of which were calcareous and ramified into the pink translucent tissue.

Left Prescapular Gland.—Normal.

Prepectoral Glands.—A right prepectoral gland was 1 in. in diameter, and composed of yellowish caseo-necrotic tissue, with calcareous deposit in its periphery. Another prepectoral gland, the size of a pea, had caseous foci in its cortex. The left prepectoral glands were normal.

Pectoral Glands, Axillary Glands.—Normal.

Cervical Glands.—A deep cervical gland on the right side, 1½ in. long, was caseo-necrotic.

Thorax.

Pleura.—Normal.

Lungs.—On the left lung sixteen tubercles were counted, varying in size from a shot to a small pea. They were rather unusual in structure. Some consisted of thick-walled cavities, which contained soft pultaceous contents; others in an earlier stage of caseation had not yet softened, and were surrounded by a good deal of translucent dense tissue. Others, again, were slightly calcareous. Besides these there were some smaller grey translucent tubercles.

On the right lung the tubercles were rather larger, and the majority of them had pultaceous contents, and thick translucent walls. Sixteen were counted on this lung.

On section two similar tubercles were seen in the right lung, and three in the left, besides two small grey tubercles.

Thoracic Glands.—The posterior thoracic gland was scarcely at all enlarged. Its surface was nodular, owing to the presence of a moderate number of shot-sized tubercles, with fibrous translucent periphery and irregular caseo-calcareous centres. The right and left bronchial glands contained several similar tubercles.

Pericardium, Heart.—Normal.

Abdomen.

Peritoneum, Omentum, Intestines, Mesenteric Glands.—Normal.

Spleen.—The spleen was found to contain about a dozen tubercles, the largest about the size of a small pea, with irregular yellow caseous centres and dense translucent margins.

Liver, Hepatic Glands, Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

Microscopical Examination.

Lung Nodule (1).—Tubercle bacilli, very short. (Five seen.)

Lung Nodule (2).—No tubercle bacilli seen.

BULL-CALF 501. (Virus H 29 "M.F.")

Subcutaneous Inoculation of emulsion of prescapular and prepectoral glands from Calf 479.

Dose—10,000,000 T.B. [Vol.: 1 c.c. of a dilution of 1 in 14·2.]

Date—September 1st, 1904.

Weight at Inoculation—1 cwt. 1 qr. 9 lbs.

Killed—December 14th, 1904. [104 days after inoculation.]

Clinical Notes.

By September 26th a swelling had developed at the seat of inoculation, measuring 4 in. by 2¼ in., and the prescapular gland was 3¾ in. in length. The animal showed no symptoms of illness.

On October 11th the swelling was about the same size, but the length of the prescapular gland had increased to 4¼ in., and a prepectoral gland, the size of a cherry, could be felt on the same side. The swelling at the seat of inoculation was now flaccid.

On October 25th the swelling felt flabby, as though it were diminishing in size, and the prescapular gland was slightly smaller.

The animal remained well until it was killed on December 14th (104 days after inoculation).

Temperature.

Except for a rise to 40° on the 15th and 16th days, the temperature was normal throughout.

Weights.

	cwts.	qrs.	lbs.
September 1st, 1904 - - - - -	1	1	9
December 14th, 1904 - - -	2	1	5

Total gain of weight.—3 qrs. 24 lbs,

The animal steadily increased in weight during the whole course of the experiment, the average gain per week being 7·2 lbs.

Tuberculin Test.

This animal was not tested before death.

POST-MORTEM EXAMINATION.

General Condition.—Fat.

Local Lesion.—The tumour at the seat of inoculation, on the right side of the neck, was easily separable from the subjacent muscle, and from the skin, except over an area about the size of a sixpence. It measured 3 in. by 2 in., and ¾ in. in its thickest part. It was densely fibrous, and infiltrated with a very calcareous network. There was a small quantity of tough yellow tissue, caseo-necrotic, but not softening.

Right Prescapular Gland.—Was enlarged, and measured 2¾ in. by 1½ in. by 1¾ in. Its cortex was entirely composed of very calcareous dense tuberculous deposit.

Left Prescapular Gland.—Normal.

Prepectoral Glands.—The right prepectoral gland contained a nodule similar to that in the right prescapular, about the size of a pea. The left was normal.

Pectoral Glands.—Normal.

Axillary Glands.—Normal.

Cervical Glands.—A deep cervical gland on the right side, at the level of the larynx, contained a tubercle, as did also a deep cervical hæmo-lymph gland.

Thorax.

Pleura.—Normal.

Lungs.—On the base of the right lung there were two small fleshy tags attached by a broad base to the pleural surface. They had no caseous or calcareous foci in them. On the surface of the right lung about a dozen little tubercles were counted. These were grey and translucent, and did not exceed the size of a small pin's head. When shelled out and crushed the larger ones were found to have calcareous centres. There were scarcely so many on the surface of the left lung.

Section revealed a few in the substance of each lung. They were difficult to see on account of their size and colour.

Thoracic Glands.—Were only slightly enlarged. They contained rather numerous very calcareous foci, mostly situated just under the capsule. There were perhaps a hundred of these in the large posterior thoracic gland—too many to count—and a proportional number in the bronchial glands.

Pericardium, Heart.—Normal.

Abdomen.

Peritoneum.—Normal.

Omentum.—In the middle of the omentum was a hard calcareous body of a reddish colour, about the size of a bean. On section a small cavity was seen with a dense calcareous wall, and round this was a small amount of fibrous tissue.

Intestines.—In the Peyer's patches of the small intestine were a number of yellow spots of pultaceous matter. These one has learnt to distinguish from tubercles by the absence of indurated tissue around them. They contained no tubercle bacilli.

Mesenteric Glands.—Normal.

Spleen.—In the spleen about twelve tubercles were counted in a single longitudinal section. They were larger than those in the liver, sometimes reaching a diameter of ⅛ in., and were very calcareous at their centres.

Liver.—Sixteen tubercles were counted on the surface of the liver; almost all were on the diaphragmatic surface of the right lobe. They were quite on the surface of the organ, and had opaque centres and translucent grey overhanging margins. Scarcely any exceeded ⅛ in. in diameter.

Section also showed tubercles sparsely scattered throughout both lobes; about one to four being counted in each longitudinal section. They were translucent, not caseous, but slightly calcareous, about the size of millet seeds.

Hepatic Glands.—A few calcareous foci were found in these glands.

Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Hyoid.—Normal.

Pharyngeal.—The right contained a single calcareous focus; the left a focus and two small nodules.

Tongue, Palate, Tonsils, Pharynx.—Normal.

Microscopical Examination.

Yellow Focus from Small Intestine.—No tubercle bacilli.

BULL-CALF 463. (Virus H 29. "M.F.")

Subcutaneous Inoculation of emulsion of prescapular and prepectoral glands from Calf 479.

Dose—1,000,000 T.B. [Vol. : 0·1 c.c. of a 1 in 14·2 dilution.]

Date—September 1st, 1904.

Weight at Inoculation—1 cwt. 1 qr. 5 lbs.

Killed—December 15th, 1904. [105 days after inoculation.]

Clinical Notes.

By September 26th a rather indefinite cord-like thickening could be felt at the seat of inoculation, measuring about 5 in. by 1¼ in. The prescapular gland on the same side was scarcely at all enlarged.

On October 11th the swelling at the seat of inoculation had much diminished in size, and there was no enlargement of the prescapular gland.

The animal was killed on December 15th, 1904, when it was apparently quite healthy.

Temperature.

The temperature rose the day after inoculation to 40°. It gradually fell, had become normal at the end of the first week, and remained so till the animal was killed.

Weights.

	cwt.	qrs.	lbs.
September 1st, 1904 - - - -	1	1	5
December 15th, 1904 - - - -	2	1	10

Total gain of weight.—1 cwt. 0 qrs. 5 lbs.

The animal steadily gained in weight during the whole course of the experiment, the average gain per week being 7·8 lbs.

Tuberculin Test.

This calf was not tested before death.

POST-MORTEM EXAMINATION.

General Condition.—Fat.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a small thin lobulated tumour, easily separable from skin and subjacent muscle. It measured 1¼ in. by 1 in., and consisted of a ramifying cavity, with thick fibrous walls and softened caseous contents.

Right Prescapular Gland.—Was about 3 in. in length. At its broader end it contained a large nodule 1 in. in diameter, composed of pink fibrous tissue, with calcareous and slightly caseous grains. At the other end of the gland was a little nodule of similar structure, and four tubercles of the size of small peas, composed of a ramifying solid caseous patch with a firm translucent border.

Left Prescapular Gland.—Contained a fibrous nodule ¾ in. in diameter, very similar to the nodule in the right prescapular gland, but not quite so firm.

Prepectoral Glands.—Normal.

Pectoral Glands.—The right pectoral gland was normal.

On the left side of the neck, lying on the border of the first rib, in the position of the pectoral glands, was a hard spherical mass, which resembled a tuberculous gland, and was found on section to be caseous throughout, and surrounded by a dense white capsule. Rather less than half was composed of the tough salmon-pink caseo-necrotic tissue found in acutely infected tuberculous glands, and the rest was fibrous, closely packed with caseo-calcareous grains. Calcareous deposit, moreover, surrounded this caseo-necrotic mass. On the whole, this lesion had the appearance of being part of a much more severe and acute affection than that of the right prescapular gland. It was at the same time more advanced, and more like that seen in severe and acute cases. It is difficult to account for its existence on the hypothesis that it was part of the infection caused by the inoculation of September 1st.

The left pectoral gland, the size and shape of a bean, contained a large fibrous nodule infiltrated with caseous and slightly calcareous foci. Another pectoral gland of about the same size was rather less affected.

Axillary Glands.—Normal.

Cervical Glands.—Three deep cervical glands, slightly enlarged, were found on the left side of the neck. One, near the root of the neck, was fairly thickly packed with caseating foci. Of two others further forward, one contained a small caseating focus.

The whole of the left side of the neck, the seat of the tuberculin inoculation, was carefully explored. Not only was the skin reflected, and the subcutaneous tissue searched for a tuberculous lesion, but the various layers of muscle were each in turn dissected off without finding anything suspicious.

The hæmo-lymph glands in this region were normal.

Thorax.

Pleura.—Normal.

Lungs.—There were some very minute translucent tubercles in the lungs, perhaps half a dozen in all. They were scarcely visible on account of their small size, and they appeared as dark greyish spots on the light-coloured lung. One could just manage to pick them out on the point of a knife, when they looked like tiny beads of glass. In one of the largest of these tubercles, before removal, an opaque centre was seen.

Thoracic Glands.—The posterior thoracic gland was not enlarged. It contained three fibrous and very calcareous nodules, the largest as big as a pea. The left bronchial gland contained two similar nodules. One right bronchial was almost entirely composed of this tissue. The other was normal.

Heart.—Normal.

Abdomen.

Peritoneum, Omentum.—Normal.

Intestines.—There were in all five pea-sized nodules in the small intestine. These had raised and rounded centres surrounded by a raised margin, and in one the centre was capped by a little rounded prominence, thus presenting a curious resemblance to the knitted cap often worn in cold countries. They seemed to represent submucous nodules, from the prominence of which the mucous membrane had been rubbed away.

In addition many of the Peyer's patches showed little yellow pultaceous foci, which experience has shown not to be tuberculous. On section they were pink and rather dense. Their centres were reddish and hard, but neither caseous nor calcareous. (Like those in 473, H 30. "E.M.")

The large intestine was normal.

Mesenteric Glands.—Normal.

Spleen.—Was not enlarged, but in it some hard nodules could be felt. When these were cut, they were found to consist of large translucent tubercles with a ramifying caseous centre. There were eight or ten of these tubercles, the largest of which was the size of a pea.

Liver.—A single pearly-white spot was seen on the posterior surface, about the size of a pin's head, with an irregular opaque centre ; a tubercle (?).

Hepatic Glands, Kidneys, Suprarenals, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

Microscopical Examination.

Intestinal Nodules.—No tubercle bacilli.

Yellow spot from Peyer's patch.—No tubercle bacilli.

CALF 693. (Virus H 29. "M.F.")

Subcutaneous Inoculation of Culture derived from Human Cervical Glands through Guinea-pig 1329

Dose—50 milligrammes.

Date—March 25th, 1905.

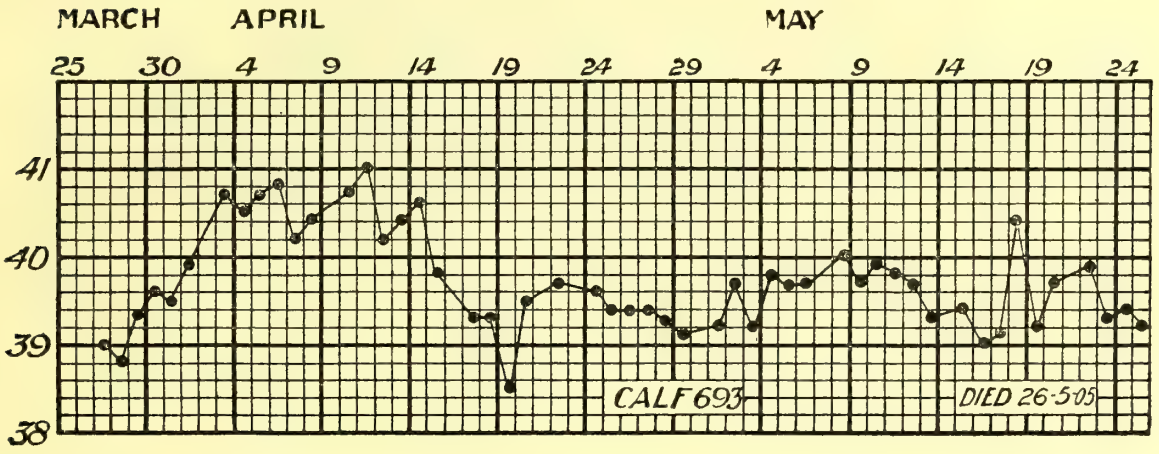
Weight at Inoculation—1 cwt. 0 qrs. 4 lbs.

Died—May 26th, 1905. [63 days after inoculation.]

Clinical Notes.

The disease slowly developed in this animal, and by the end of April it was obviously very ill. It became gradually thinner, and died rather suddenly after two days' severe illness.

Temperature.



Weights.

	cwt.	qrs.	lbs.
March 25th, 1905	1	0	4
May 26th, 1905	0	3	15

Total loss of weight.—17 lbs.

The average loss per week was 1·9 lbs. The animal increased slightly in weight for the first six weeks of the experiment. The loss during the fortnight before its death was 20 lbs.

Tuberculin Test.

This animal was not tested before death.

POST-MORTEM EXAMINATION.

General Condition.—Very thin.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a flat solid tumour, which measured $5\frac{1}{2}$ in. by 3 in. by $1\frac{3}{4}$ in., and weighed 8 ozs. It was composed of dense caseo-necrotic tissue, and infiltrated the skin and subjacent muscle.

Right Prescapular Gland.—Measured $3\frac{1}{4}$ in. by $1\frac{3}{4}$ in. by $1\frac{1}{2}$ in., and weighed 2 ozs. It was caseous-necrotic throughout.

Left Prescapular Gland.—Was small and rather flabby, and contained a considerable number of caseo-tubercles.

Prepectoral Glands.—The right prepectoral gland was the size of a large pea, and similar to the right prescapular gland.

Pectoral Glands.—The right pectoral gland was considerably enlarged. It had numerous caseous foci in its cortex, in part confluent. The left pectoral gland resembled the left prescapular gland.

Axillary Glands.—Were small and rather flabby, and contained a considerable number of caseous tubercles.

Thorax.

Pleura.—The fringes along the margins of the ribs were hypertrophied, and many small tubercles could be seen in the pleura from which they sprang.

The pleural surface of the diaphragm, the pleural surface of the pericardium, and the mediastinal folds were spotted with tufts of congested fringes. In these many yellowish-white lenticular tubercles, having a diameter of from a $\frac{1}{32}$ in. to $\frac{1}{16}$ in. could be seen. The majority of these were situated in the fringes, and were loosely attached by them to the pleura.

Lungs.—Were heavy and voluminous, and weighed 5 lbs. 8 ozs. The small anterior lobes were deeply congested and dark purple in colour, and almost airless. The lungs were everywhere studded fairly thickly with tubercles of various sizes, the larger ones being about $\frac{1}{8}$ in. in diameter.

Section showed that the lungs were everywhere far more severely affected than the appearance of the surface indicated. Almost the whole of the tubercle was caseous, and in many cases the tubercles were confluent, and formed areas of caseous consolidation with a very irregular outline. Around these tubercles and tuberculous patches there was intense congestion, so that the portion of the lung which still contained air was reduced to a very small extent.

Trachea.—There was a considerable number of tubercles in the trachea, many of which showed small points of ulceration.

Thoracic Glands.—Were large, and together weighed nearly $3\frac{1}{2}$ ozs. They were coarsely granular on the surface, firm and elastic, deeply congested, and had their cortices packed with confluent grey tubercles with irregular caseating centres. These in many places had coalesced to form a moss-like pattern.

Heart.—The surface of the heart was studded with hæmorrhages. One tubercle was found in the terminal portion of the vena cava superior, and another some 4 in. higher up.

Abdomen.

Peritoneum, Omentum.—On the omentum and the falciform ligament were a few tubercles similar to those found on the pleural surfaces of the pericardium and diaphragm. They were rather large, themselves yellow, and surrounded by a zone of congestion.

Intestines.—In both the small and the large intestine were a good number of small caseating tubercles.

Mesenteric Glands.—Some were slightly enlarged; many were normal in size. The latter contained tubercles and tuberculous nodules, while the former had their cortices generally infiltrated with translucent grey tissue more or less studded with minute opaque foci.

Spleen.—Was small and flabby. It contained a considerable number of tubercles, mostly at the thick end of the organ.

Liver.—The liver was moderately thickly studded with pale tubercles, almost all of which were superficial; the largest were about ⅛ in. in diameter. In the liver substance the tubercles were somewhat sparsely scattered. Both in the liver and spleen tubercles could be seen through the walls of the veins, but did not reach their inner surfaces.

Hepatic Glands.—Were enlarged, and resembled the thoracic.

Kidneys.—Several small tubercles were seen on the surface of each kidney, and a few were revealed by section.

Suprarenals.—Normal.

Renal Glands.—Were packed with caseous tubercles

Lumbar Glands, Iliac Glands.—Were small and rather flabby, and contained a considerable number of caseous tubercles.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal.—Were small and rather flabby, and contained a considerable number of caseous tubercles.

Submaxillary, Parotideal.—All contained a considerable number of caseous tubercles.

Pharyngeal.—Were rather thickly packed with caseous nodules.

Hyoid.—Resembled the submaxillary.

Tongue.—Normal.

Tonsils.—No definite tubercles were seen in either.

Pharynx.—No definite tubercle were seen, but the mucous membrane of the naso-pharynx appeared to be thicker than normal, and to have minute opaque points in it. (No tubercle bacilli.)

Microscopical Examination.

Scraping from Naso-Pharynx.—No tubercle bacilli.

Scraping from Tongue.—No tubercle bacilli.

Scraping from under surface of Palate.—No tubercle bacilli.

Tubercle from Heart.—Tubercle bacilli

Tubercle from Vena Cava Superior.—Tubercle bacilli.

CALF 697. (Virus H 29. "M.F.")

Subcutaneous Inoculation of Culture derived from Human Cervical Glands through Guinea-pig 1329.

Dose—50 milligrammes.

Date—March 25th, 1905.

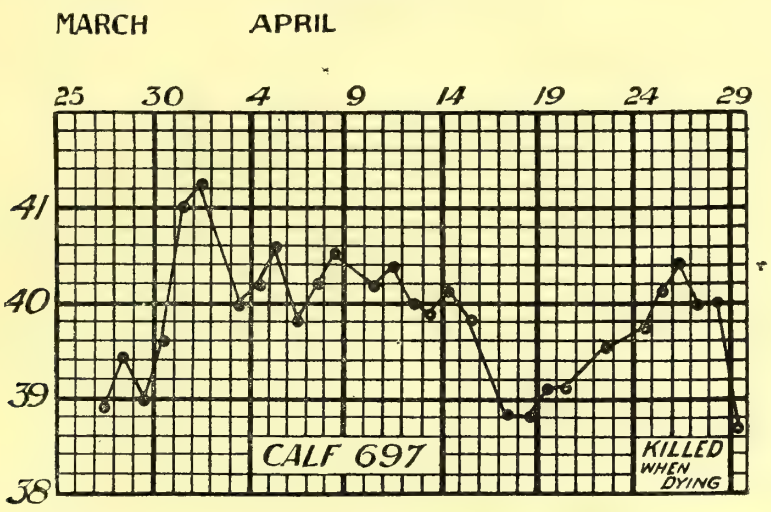
Weight at Inoculation—1 cwt. 0 qrs. 3 lbs.

Killed—April 29th, 1905. [35 days after inoculation.]

Clinical Notes.

On April 25th, a month after inoculation, respiration increased, and the animal was killed when dying, 4 days later. The progress of the disease in this case was similar to that which is usually seen in animals inoculated with virulent viruses.

Temperature.



Weights.

	cwt.	qrs.	lbs.
March 25th, 1905	1	0	3
April 29th, 1905	1	0	0

Total loss of weight.—3 lbs.

The animal gained 12 lbs. in weight during the first seventeen days of the experiment. During the five days previous to its death it lost 8 lbs.

Tuberculin Test.

This animal was not tested before death.

POST-MORTEM EXAMINATION.

General Condition.—Thin.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a flat tumour, which measured 5 in. by 3½ in. by 1¾ in., and weighed 9 ozs. It was composed of dense fibrous salmon-pink caseo-necrotic tissue, with a small cavity containing serous fluid, and infiltrated the skin and subjacent muscle.

Right Prescapular Gland.—Measured 3½ in. by 2 in. by 1½ in., and was caseo-necrotic throughout.

Left Prescapular Gland.—Contained rather numerous tubercles in an early stage of caseation.

Prepectoral Glands.—The right spherical prepectoral gland, $\frac{7}{8}$ in in diameter, was similar in structure to the right prescapular.

Axillary Glands.—Contained rather numerous tubercles in an early stage of caseation.

Thorax.

Pleura.—Was scarcely affected.

Lungs.—The lungs were extensively consolidated, and weighed 4 lbs. 11 ozs. More than the anterior half was dark red and airless, the whole organ being thickly infiltrated with minute grey tubercles.

Thoracic Glands.—Were much enlarged, their cortices being entirely composed of yellowish caseating network, infiltrating a translucent grey tissue.

Heart.—A single rather large tubercle was found in the lining of the right auricle, or rather in the termination of the vena cava inferior.

Abdomen.

Peritoneum, Omentum.—The omentum contained a few tubercles.

Intestines.—There were a considerable number of little tuberculous foci in the mucous membrane of the intestines.

Mesenteric Glands.—All contained rather numerous tubercles, in an early stage of caseation.

Spleen.—Contained numerous very small tubercles, which could just be distinguished from the Malpighian bodies.

Liver.—Contained a considerable number of small grey tubercles, some of which projected slightly on the surface. The largest of these had opaque centres, and the superficial ones had flattened grey margins.

Hepatic Glands.—Were much enlarged, and resembled the thoracic.

Kidneys.—The kidneys contained numerous small grey tubercles scattered throughout the cortex.

Suprarenals.—Each contained several small tubercles.

Iliac Glands.—Contained rather numerous tubercles in an early stage of caseation.

Renal Glands, Lumbar Glands.—Were more severely affected than the iliac and other lymphatic glands.

Genito-Urinary System.

Testes.—There were two or three tubercles in each testis.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal.—Contained rather numerous tubercles in an early stage of caseation.

Parotideal, Pharyngeal.—Contained numerous tubercles in an early stage of caseation.

Submaxillary and Hyoid.—Were slightly less severely affected.

Tongue.—Normal.

Tonsils.—Both contained tubercles.

Pharynx.—The dorsal wall of the pharynx, especially the corrugated mucous membrane extending from the nasal septum, contained numerous tubercles.

Eyes.—Normal.

Microscopical Examination.

Tubercle from Intestine (Ileum).—Tubercle bacilli.

Tubercle from Suprarenal.—Tubercle bacilli numerous.

Tubercle from Left Testicle.—Tubercle bacilli.

Tubercle from Heart.—Tubercle bacilli few.

Bone Marrow.—No tubercle bacilli.

CALF 841. (Virus H 29. "M.F.")

Subcutaneous Inoculation of Culture derived from human cervical glands, through Guinea-pig 1329.

Dose—50 milligrammes.

Date—June 5th, 1905.

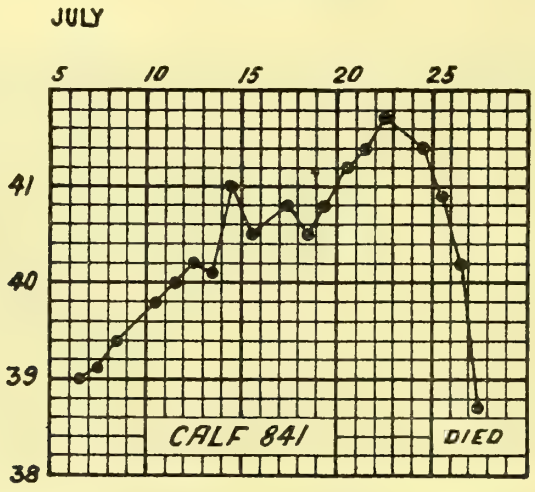
Weight at Inoculation—3 qrs. 21 lbs.

Died—July 28th, 1905. [23 days after inoculation.]

Clinical Notes.

The disease ran the usual course, and no special features were noted during the illness. The animal died 23 days after inoculation.

Temperature.



Weights.

	cwt.	qrs.	lbs.
June 5th, 1905	0	3	21
July 28th, 1905	0	3	2

Total loss of weight.—19 lbs.

The average rate of loss per week during the experiment averaged 5·7 lbs.

Tuberculin Test.

This animal was not tested before death.

POST-MORTEM EXAMINATION.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a solid tumour, which weighed 6 ozs., and measured 4½ in. by 3½ in. by 1½ in. It was caseo-necrotic, and infiltrated the skin and subjacent muscle.

Right Prescapular Gland.—Was much enlarged; it weighed 3 ozs., and measured 3½ in. by 1¾ in. by 1½ in. It was not so firm as usual, only partly caseo-necrotic, the rest being greyish-pink and elastic.

Left Prescapular Gland.—Was swollen, and a few early tubercles could be seen in it.

Prepectoral Glands.—The right prepectoral gland was the size of a cherry, and similar to the right prescapular.

Axillary Glands.—No tubercles could be made out with certainty in these glands.

Thorax.

Lungs.—Were rather heavy (weight, 4 lbs.). They were deeply congested, the anterior parts ranging from a dark red to a blackish-purple colour. On the surface of the darker parts numerous little pale points (tubercles) could be seen. The posterior and upper parts of the lung were less congested, and tubercles were not visible on the surface. Section showed even the posterior lobes congested. The lung was everywhere more solid and firmer than usual, and thickly peppered with innumerable minute whitish grey tubercles.

Thoracic Glands.—The posterior thoracic and bronchial glands were moderately enlarged, firm and elastic, composed of elastic translucent grey tissue, which contained a caseating network.

Heart.—A single minute doubtful tubercle was seen in the lining of the right auricle. The rest of the heart was normal.

The jugular vein from the seat of inoculation was normal.

Abdomen.

Intestines.—Nothing abnormal seen.

Mesenteric Glands.—No tubercles could be made out with certainty (but tubercle bacilli were found in two of them which were examined microscopically).

Spleen.—Showed no visible tubercles.

Liver.—The surface of the liver was thickly peppered over with minute greyish white tubercles, and section showed them in large numbers throughout the organ.

Portal Glands.—Were moderately enlarged, and rather firm and elastic. They were in an earlier stage of tuberculous change than the thoracic.

Kidneys.—There were a small number of minute grey tubercles, just distinctly visible, on the surface of each kidney, and a larger number of indistinct points which could not be clearly seen. On section it was difficult to make out any of these early tubercles.

Suprarenals.—No tubercles seen.

Renal Glands, Lumbar Glands, Iliac Glands.—No tubercles could be made out with certainty.

Special Glands.

Precrural, Gluteal, Popliteal.—Were swollen, and a few early tubercles could be seen in them.

Submaxillary.—The right submaxillary gland was swollen, and a few early tubercles could be seen in it. No tubercles could be made out with certainty in the left.

Parotideal.—There were some small tubercles in the parotideal glands.

Post-Pharyngeal.—Were swollen, and a few early tubercles could be seen in them.

Hyoid.—Contained several nodules and early tubercles.

Pharynx, Larynx.—Normal.

Microscopical Examination.

Spleen.—Tubercle bacilli.

Lumbar Gland.—Tubercle bacilli.

Mesenteric Gland.—Tubercle bacilli.

CALF 847. (Virus H 29. "M.F.")

Subcutaneous Inoculation of Culture derived from human cervical glands, through Guinea-pig 1329.

Dose—50 milligrammes.

Date—July 5th, 1905.

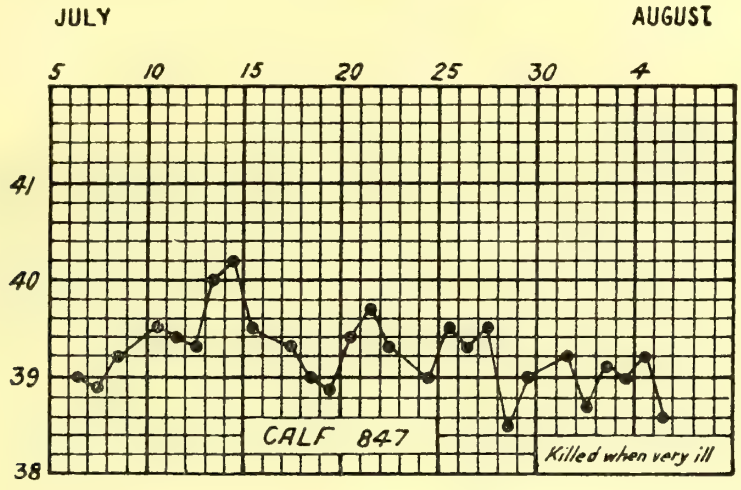
Weight at Inoculation—3 qrs. 11 lbs.

Killed when ill—August 5th, 1905. [31 days after inoculation.]

Clinical Notes.

In this instance the disease ran the usual course. On August 5th the animal was very ill, and its death was daily expected. It was therefore killed (31 days after inoculation).

Temperature.



Weights.

	qrs.	lbs.
July 5th, 1905	3	11
August 5th, 1905	2	26

Total loss of weight: 13 lbs. Rate of loss per week: 3 lbs.

Tuberculin Test.

This animal was not tested before death.

POST-MORTEM EXAMINATION.

Local Lesion.—At the seat of inoculation, on the right side of the neck, there was a large flat solid tumour, which measured 6½ in. by 3½ in. by 1½ in., and weighed 12 ozs. It was salmon-pink in colour, and caseo-necrotic, and contained an irregular central cavity full of serum. It infiltrated both the skin and subjacent muscle.

Right Prescapular Gland.—Was enlarged, 3 in. by 1¾ in. by 1½ in., and weighed 3 ozs. Caseo-necrotic throughout.

Left Prescapular Gland.—Contained several tubercles.

Prepectoral Glands.—The right prepectoral gland was the size of a pigeon's egg, and similar in structure to the right prescapular gland.

Thorax.

Pleura.—Early tubercles, surmounted by hypertrophied fringes, along many of the ribs.

Lungs.—Were rather heavy, and weighed 3 lbs. They were rather thickly studded with small grey tubercles with a red translucent margin, and in places these margins were confluent, particularly in the anterior lobes, causing large areas which were almost entirely consolidated. Section showed similar tubercles scattered throughout the lung.

Trachea.—Normal.

Thoracic Glands.—Moderately enlarged, grey and firm, with early caseating foci.

Heart.—Normal.

Abdomen.

Omentum.—Contained a moderate number of little translucent tubercles.

Intestines.—Contained a few yellow foci.

Mesenteric Glands.—Many glands contained several tubercles.

Spleen.—Was thickly packed with little tubercles, which were apparently developing in the Malpighian bodies.

Liver.—Was thickly studded with many little tubercles not exceeding $\frac{1}{16}$ in. in diameter. Similar tubercles were scattered throughout, and appeared in the walls of the veins, projecting into the lumen.

Portal Glands.—Were slightly enlarged and firmer than normal. The cortex was mottled with a more opaque tissue than the rest, and seemed to be the seat of a general tuberculous change.

Kidneys.—Contained a considerable number of small grey tubercles. Much of the cortex was pale and lar.

Suprarenals.—Each contained one or two tubercles.

Renal Glands, Lumbar Glands, Iliac Glands.—All contained several or many tubercles.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal.—All contained several or many tubercles.

Submaxillary, Parotideal, Post-Pharyngeal, Hyoid.—All contained tubercles, some few, some many.

Tongue.—Normal.

Palate.—There was a caseating tubercle in the mucous membrane of the palate, and two in the corrugated mucous membrane which descends from the nasal septum.

Tonsils, Larynx.—Normal.

Microscopical Examination.

Focus from Small Intestine.—Tubercle bacilli numerous.
Tubercle from Palate.—Tubercle bacilli numerous.
Scraping from Portal Gland.—Tubercle bacilli numerous.

CALF 835. (Virus H 29. "M.F.")

Subcutaneous Inoculation of Culture derived from human cervical glands, through Guinea-pig 1329.

Dose—10 milligrammes.

Date—July 5th, 1905.

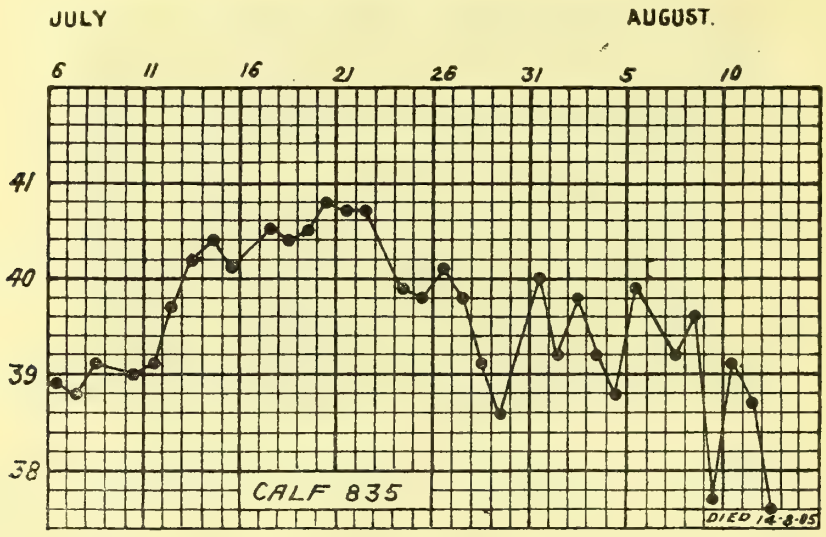
Weight at Inoculation—3 qrs. 8 lbs.

Died—August 14th, 1905. [40 days after inoculation.]

Clinical Notes.

The disease progressed slowly, but steadily, the animal becoming extremely thin and obviously ill, and respiratory symptoms appeared ten days after inoculation. The symptoms increased in severity, and by August 1st the animal was very thin and weak, and the respirations short and rapid. It rapidly became worse; the breathing was spasmodic: there was some cough; emaciation became very marked, and on August 13th the calf was obviously dying. It was found dead on the following day (August 14th) 40 days after inoculation.

Temperature.



Weights.

	qrs.	lbs.
July 5th, 1905	3	8
August 14th, 1905	3	0

Total loss of weight.—8 lbs.

The rate of loss per week averaged 1·4 lbs.

Tuberculin Test.

The animal was not tested with tuberculin before death.

POST-MORTEM EXAMINATION.

General Condition.—Extremely thin.

Local Lesion.—The tumour at the seat of inoculation, on the right side of the neck, measured 4 in. by 3 in. by 1¾ in., and weighed 7 ozs. It was solid, caseo-necrotic, and widely infiltrated the skin and subjacent muscle and subcutaneous tissue in the direction of the sternum.

Right Prescapular Gland.—Measured 3¼ in. by 2½ in. by 1⅜ in., and weighed 3 ozs. It was caseo-necrotic throughout.

Prepectoral Glands.—The right prepectoral gland was as large as a cherry, and was similar in structure.

Left Prescapular Gland.—Contained several rather large caseating tubercles.

Axillary Glands.—Contained rather large caseating tubercles.

Cervical Glands.—Two deep cervical glands were enlarged and caseo-necrotic.

Thorax.

Pleura.—Little tubercles were seen along the margins of some of the ribs under the hypertrophied fringes.

Lungs.—Were extremely and widely congested, and contained but little air. They were rather thickly studded and packed with little well-defined irregular caseating tubercles, each surrounded with a red translucent soft zone, and these latter were often confluent with one another so that solid and air-containing patches of small size alternated pretty equally in the right lung, while the left, which was darker in colour, was almost entirely airless.

Trachea.—About half-a-dozen tubercles were found in the trachea.

Thoracic Glands.—Were much enlarged and firm. Their cortex was grey and translucent, and thickly packed with caseating striæ and foci.

Heart.—Normal.

Abdomen.

Peritoneum, Omentum.—Many small red tubercles were seen on the omentum.

Intestines.—The small intestine contained many rather large firm yellowish tubercles, widely scattered.

A good many less developed tubercles were seen in the large intestine, and they were rather numerous in the cæcum.

Mesenteric Glands.—Contained caseating tubercles and tuberculous nodules.

Spleen.—Was thickly packed with rather large tubercles, which were commencing to turn yellowish-white at their centres. Their margins were not clearly distinguished from the surrounding tissue.

Liver.—The liver, which appeared somewhat shrunken, was rather thickly studded with little greyish-white raised tubercles. Section showed a moderately large number of these little tubercles scattered throughout.

Portal Glands.—Some contained grey translucent nodules with caseating foci and striæ. Others had their cortex entirely transformed into this tissue.

Kidneys.—Contained a moderately large number of small whitish tubercles, often seen in little groups on the surface.

Suprarenals.—Contained one or two small tubercles.

Renal Glands, Lumbar Glands, Iliac Glands.—Contained several or many rather large caseating tubercles.

Genito-Urinary System.

Testes.—The left contained several tubercles, two as big as little peas.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal.—Contained several or many rather large caseating tubercles.

Submaxillary, Parotideal, Post-Pharyngeal, Hyoid.—Contained caseating tubercles and tuberculous nodules.

Tongue.—Normal.

Tonsils.—Several caseous tubercles were seen in each tonsil.

Pharynx.—Contained a few yellow tubercles, and several were seen in the corrugated mucous membrane which descends from the nasal septum.

Eyes.—Normal.

CALF 839. (Virus H 29. "M.F.")

Subcutaneous Inoculation of Culture derived from human cervical glands, through Guinea-pig 1329

Dose—10 milligrammes.

Date—July 5th, 1905.

Weight at Inoculation—3 qrs. 18 lbs.

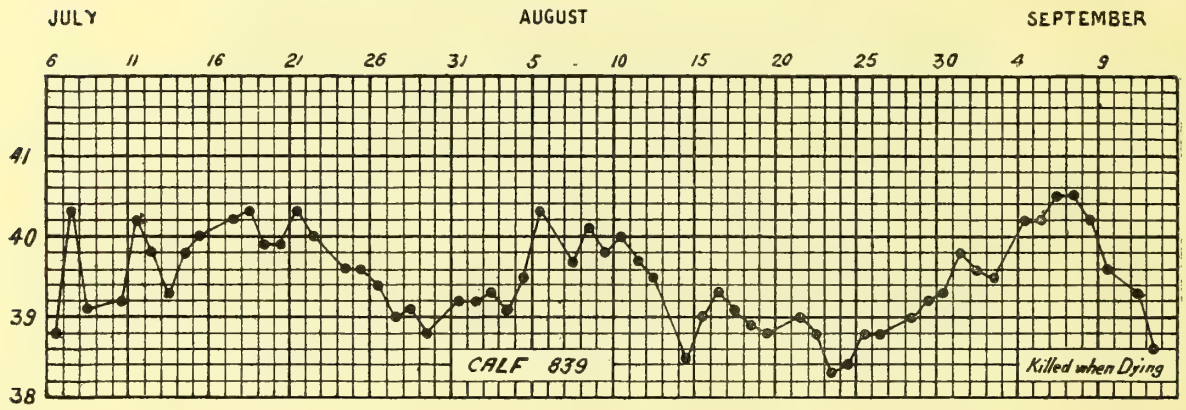
Killed when dying, September 12th, 1905. [69 days after inoculation.]

Clinical Notes.

Symptoms of the disease gradually developed, and the calf became progressively thinner. Respiration was accelerated towards the end of the second week after inoculation, and by September 11th had become very rapid and laboured, and there was also some cough.

On September 12th the animal was much worse, and evidently in a moribund condition. The temperature had fallen, and respiration was very difficult and laboured. It was therefore killed (69 days after inoculation).

Temperature.



Weights.

	cwt.	qrs.	lbs.
July 5th, 1905 - - - - -	0	3	18
September 12th, 1905 - - - -	0	3	26

Total gain of Weight.—8 lbs.

The rate of gain of weight during the experiment averaged 0·8 lbs.

Tuberculin Test.

The animal was not tested before death.

POST-MORTEM EXAMINATION.

Local Lesion.—The tumour at the seat of inoculation, on the right side of the neck, measured 5 in. by $2\frac{3}{4}$ in. by 1 in., and weighed 6 ozs. It was solid, fibro-necrotic, and infiltrated the skin and muscles, but not extensively.

Right Prescapular Gland.—Measured 3 in. by $1\frac{1}{2}$ in. by $1\frac{1}{4}$ in., and weighed 3 ozs. It was salmon-pink, caseo-necrotic, and contained here and there little opaque calcareous grains.

Left Prescapular Gland.—Contained many shot-sized fibro-caseous tubercles.

Prepectoral Glands.—The right prepectoral gland was the size of a small cherry, and in structure similar to the right prescapular.

Axillary Glands.—Contained many shot-sized fibro-caseous tubercles.

Thorax.

Pleura.—Normal.

Lungs.—Weighed $4\frac{1}{2}$ lbs. The surface was uniformly beset with tubercles, which did not rise much above the surface. They reached a size of $\frac{1}{8}$ in. or $\frac{1}{6}$ in. or even more. They were somewhat angular in shape. The posterior and dorsal ones had a dark reddish-grey outline, while those in the anterior lobes were surrounded by dark red zones, which were often confluent with their neighbours.

Section showed the tubercles to be very thickly scattered throughout the lung substance.

Trachea.—Normal.

Thoracic Glands.—Were much enlarged. The cortex was composed of a ramifying caseating network, enclosed in a translucent grey matrix.

Heart.—Normal.

Abdomen.

Peritoneum.—Normal.

Intestines.—At the anterior end of the small intestine were a few small tuberculous nodules. In the middle part were a few tubercles in the Peyer's patches. In the terminal portion, for about two or three feet, there were numerous pea-sized tuberculous nodules, which caused the mucous membrane to project into the lumen of the gut. Some were slightly ulcerated.

In the cæcum were numerous shallow ulcers with congested margins; between fifty and sixty were counted Similar ulcers extended throughout the large intestine

Mesenteric Glands.—Were much enlarged, and packed with pea-sized fibro-caseous nodules. The glands near the narrow end of the mesentery had undergone a general tuberculous change in the cortex, and resembled the thoracic.

Spleen.—Was small, and contained only a moderate or small number of little yellow tubercles.

Liver.—Rather a large number of small tubercles could be seen from the surface, more or less dimly through a greater or less thickness of liver substance. None seemed to be quite on the surface. On section the tubercles were scattered about as thickly as near the surface, but they were not conspicuous, being grey and very small.

Hepatic Glands.—Were enlarged, and in structure resembled the thoracic.

Kidneys.—One or two small tubercles were seen on the surface of each and the same number on section.

Suprarenals.—Each contained a single tubercle.

Renal Glands, Lumbar Glands.—Were severely affected.

Iliac Glands.—Contained many shot-sized fibro-caseous tubercles.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal.—Contained many shot-sized fibro-caseous tubercles.

Submaxillary, Parotideal, Post-Pharyngeal, Hyoid.—Contained numerous fibro-caseous tubercles.

Tongue.—Normal.

Tonsils.—A doubtful tubercle was found in the right tonsil. The left was normal.

Pharynx.—In the corrugated mucous membrane which descends from the nasal septum on to the dorsal wall of the pharynx was a caseous tubercle.

Larynx.—Normal.

Microscopical Examination

Scraping from Ulcer in Cæcum.—Tubercle bacilli very numerous.

VIRUS H 30. "E.M."

MESENTERIC AND BRONCHIAL GLANDS (Post-mortem).

TABLE 30.

VIRUS H 30. "E.M."

MESENTERIC AND BRONCHIAL GLANDS.

May 24, 1904.

GUINEA-PIGS (1st series).

1,284	Killed -	50 days -	G.T.
1,285	„ -	50 „ -	G.T.

July 13, 1904.

GUINEA-PIGS (2nd series)

1,336	Died	26 days -	Tuberculous Peritonitis.
1,337	„	26 „ -	
1,338	„	23 „ -	
1,339	„	26 „ -	

RABBIT.

114	Killed	72 days	Almost nil.

August 8, 1904.

E. of lesions from Guinea-Pigs 1,336-1,339.



BULL-CALF 473.

Subcutaneous

Dose: 4,756,800,000 T.B.

Killed, November 29, 1904.

113 days.

P M.—Fibro-calcareous local lesion. Caseo-calcareous nodules in nearest glands. Minute ulcers or yellow foci [with T.B.] occur in the entire length of intestines.

All mesenteric glands contain numerous calcareous grains. [S.T.]

RABBITS.

121	Killed	94 days	Slight Tuberculous Peritonitis. Few tubercles in lungs, one in kidney.
122	Died	28 „	Tuberculous peritonitis.



BULL-CALF 481.

Subcutaneous.

Dose: 4,756,800,000 T.B.

Killed, December 9, 1904.

123 days.

P.M.—Healed scar at seat of inoculation. Caseo-calcareous nodules in nearest glands. Calcareous foci in nearly all lymphatic glands, particularly the mesenteric. Three ulcers and many calcareous foci in small intestine. One tubercle in each suprarenal. [S.T.]

TABLE 30A.

VIRUS H 30. "E.M."

MESENTERIC AND BRONCHIAL GLANDS.

CULTURE INOCULATION.

December 20, 1904.

Strain derived from human mesenteric and bronchial glands, through Guinea-Pig 1,337.

Total duration of artificial cultivation, 4½ months.

Subcultures used for injection : 20 days old, on pure serum and on glycerin-serum.

(1) Culture on pure serum only.



BULL-CALF 593.

Subcutaneous.

Dose : 50 mg.

Killed, March 18, 1905.

88 days.

P.M.—Caseo-necrotic tumour, nearest glands caseo-necrotic. Few minute foci in thoracic glands, lungs, and liver. **(S.T.)**

RABBITS.

212	1 mg.	K. 88 days	Tuberculous peritonitis. Tubercles in kidneys, lungs, and uterus.
213	10 mg.	„ 88 „	Slight tuberculous peritonitis. Few tubercles in lungs and kidneys.
214	50 mg.	D. 36 „	Acute tuberculous peritonitis.

(2) Culture on glycerin-serum only.

RABBITS.

215	1 mg.	K. 88 days	Slight tuberculous peritonitis. Very slight tuberculosis of lungs. One tubercle in kidney
216	10 mg.	„ 88 „	Slight tuberculous peritonitis. Tuberculosis of lungs and kidneys.



BULL-CALF 599

Subcutaneous.

Dose : 50 mg.

Killed, March 18, 1905.

88 days.

P.M.—Small local tumour, small calcareous nodules in nearest glands. **(L.T.)**

VIRUS H 30. "E.M."

E.M., A Female Child Aged Three Years and Ten Months, Admitted to Hospital on April 15th, 1904, Suffering from General Tuberculosis. Died May 22nd, 1904.

Family History.—No history of tubercle.

Clinical History.—The child was stated to have been delicate from birth. She had measles and chickenpox at the age of two. She had been in a Children's Hospital some months previously for some cause unknown.

The present illness began with emaciation about seven weeks before admission. The mother stated that the child had slight cough at times.

On admission the child was obviously in pain, but there was no special localised tender area. There was constant and considerable diarrhœa. The heart was normal. There was no dulness; the abdomen was not distended. The liver and spleen could not be felt.

On April 18th, three days after admission, there was sudden collapse. The diarrhœa continued, and the weakness was progressive. The temperature was subnormal. The child became steadily worse, and the temperature rose above normal. She died on May 22nd, about five weeks after admission.

POST-MORTEM EXAMINATION.

There were no scars in the neck, but some enlarged cervical glands could be detected. An enlarged inguinal gland was also found on the right side.

Thorax.

Lungs.—Were apparently normal, but were not cut at the post-mortem examination.

Bronchial Glands.—Were enlarged and white.

Abdomen.

Peritoneum.—Adherent to the intestines, the inflammation apparently being of old standing.

Intestines.—Were extensively ulcerated.

Mesenteric Glands.—Enlarged, and matted to the intestines.

Liver, Spleen and Kidneys.—Normal.

Meninges of Brain.—Healthy.

DESCRIPTION OF MATERIAL RECEIVED AT BLYTHWOOD.

Left Lung.—Contained several dark grey tubercles about the size of a shot and very hard in structure. They appeared to be fibrous, and showed no evidence of caseation, though one of them was apparently slightly calcified.

No bacilli were found in these tubercles on microscopic examination in a fresh state. A section cut after hardening showed a fibro-cellular nodule, but nothing specially characteristic of tubercle and no tubercle bacilli.

Mesenteric Glands.—Consisted of a lobulated mass the shape and size of a calf's kidney. They were mostly firm, tough, and of a creamy white colour, but the centres of some of them had commenced to soften.

Bronchial Glands.—Resembled the mesenteric in appearance, and it was impossible to say in which of the two the disease was more advanced.

Microscopical Examination.—One tubercle bacillus only was seen in a smear made from the emulsified mesenteric and bronchial glands.

CALF 473. (Virus H 30. "E.M.'

Subcutaneous—Inoculation of emulsion of lesions of Guinea-pigs 1336-1339.

Dose—4,756,800,000 tubercle bacilli.

Date—August 8th, 1904.

Weight at Inoculation—1 cwt. 0 qrs. 20 lbs.

Killed—November 29th, 1904. [113 days after inoculation.]

Clinical Notes.

The calf was inoculated on August 8th, 1904. Fifteen days later there was a large hot swelling at the seat of inoculation, measuring about 7 in. by 4 in.; indefinite below, where it merged into œdema which reacted to the bottom of the dewlap. The right prescapular gland was enlarged, 3 in. long. The calf appeared unwell, with roughened coat.

On August 29th, 3 weeks after inoculation, the swelling measured 7 in. by 4 in., as before; the prescapular gland was 4 in. long. The animal was better, and its coat somewhat less rough.

On September 23rd, 9 weeks after injection, the swelling was thin and flat, extending broadly into the dewlap and measured 10 in. by 4 in. The gland was 3½ in. long.

Both the local swelling and the prescapular gland subsequently diminished considerably in size

On November 29th, 113 days after inoculation, the calf was killed. It had been in good health for the preceding two months.

Temperature.

During the first month the temperature was irregular and above the normal. It subsequently fell, and, with the exception of a sudden and temporary rise on October 25th, remained normal till the animal was killed.

Weights.

During the first three weeks the calf lost 3 lbs. Afterwards it gained weight at the normal rate.

	cwt.	qrs.	lbs.	
August 8th, 1904 - - -	1	0	20	Inoculated.
August 30th, 1904 - - -	1	0	17	
September 14th, 1904 - -	1	1	2	
September 27th, 1904 - -	1	1	18	
October 11th, 1904 - - -	1	2	6	
October 25th, 1904 - -	1	2	15	
November 8th, 1904 - -	1	2	27	
November 29th, 1904 - -	1	3	15	Killed.

Total Gain of Weight during Experiment.—2 qrs. 23 lbs.

Average Rate of Gain per Week.—4·9 lbs.

Tuberculin Tests.

No. I. 12th September. 35 days after inoculation. Reacted. Rise of temperature 1·6°C.

No. II. September 15th. 38 days after inoculation. Rise of temperature 1·2°C.

No. III. September 19th. 42 days after inoculation. Rise of temperature 0·9°C.

No. IV. September 23rd. 46 days after inoculation. Rise of temperature 1·0°C.

POST-MORTEM EXAMIATINON.

General Condition.—Good.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a tumour 4 in. by 2 in. by 1 in., situated between skin and muscle. It was composed of rather dense fibrous tissue, packed with calcareous grains extending downwards towards the dewlap, beyond the limits of the tumour as above defined. A few grains occurred in the skin, but the muscle was not infiltrated.

Right Prescapular Gland.—Was slightly enlarged, and contained several caseo-calcareous nodules, one being one and a quarter inches in its greatest diameter.

Left Prescapular Gland.—Normal.

Right Prepectoral Gland.—Was as large as a pea, was caseo-calcareous throughout.

Pectoral Glands, Axillary Glands.—Normal.

Thorax.

Pleura.—Normal.

Lungs.—Were normal. They showed very numerous petechial hæmorrhages, such as had frequently been seen in healthy animals.

Thoracic Glands.—The posterior thoracic and bronchial glands were rather large, being much congested. They did not contain any tubercles.

Heart.—Normal.

Abdomen.

Peritoneum, Omentum.—Normal.

Small Intestine.—In the mucous membrane of the ileum were numerous raised spots about a sixth of an inch in diameter, circular, with a central depression. They were rather pinker than the rest of the mucous membrane, were not very conspicuous, and almost disappeared when the mucous membrane was stretched. About a third of the way down they ceased to appear, but little yellow foci were seen in the Peyer's patches. These were most easily seen from the peritoneal surface as little yellowish points, which felt hard, and were found to consist of a minute collection of pultaceous caseous matter. In addition, there was around some of them a certain amount of indurated grey tissue. They occurred in almost all the Peyer's patches. When the long continuous Peyer's patch of the lower end of the ileum was reached, it was found to be the seat of innumerable small superficial ulcers, with very slightly indurated margins. Some of these presented a slight resemblance to the spots already mentioned as occurring in the duodenum, but the majority were angular or irregular in shape, and some were distinctly as if punched out of the mucous membrane.

Large Intestine.—In the large intestine the solitary follicles were surrounded by a darker coloured depressed ring, and this again by a slightly raised margin. Some of the follicles had a central depression, so that in these cases there appeared two raised rings with a circular depression between, and a depression in the common centre. The whole of the intestine was thickly studded with these appearances. The majority were circular, some were quite irregular. They became less numerous as the rectum approached.

Œsophageal Glands.—Were rather large and much congested. They did not contain any tubercles.

Mesenteric Glands.—Were very large, but were evidently in a state of functional activity, the gut being full of food. They all contained numerous little calcareous foci, very uniformly scattered. These were embedded in what appeared to be perfectly normal gland tissue, being quite soft. (The fellow to this animal had a discharging lesion at the seat of inoculation which was the probable source of infection of the alimentary canal in this case.)

Spleen.—Normal.

Liver.—Contained a little fibrous nodule with a yellow centre, about the size of a small shot. Otherwise normal.

Hepatic Glands, Kidneys.—Normal

Suprarenals.—The left had a little brownish translucent raised body about the size of a large pin's head. It was embedded in the cortex and raised above the general surface. Tubercle bacilli were found in it.

Renal Glands, Lumbar Glands.—Normal.

Cœliac Glands.—Contained numerous little calcareous foci, very uniformly scattered, similar to those found in the mesenteric glands.

Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

Microscopical Examination.

Yellow Spot from Liver.—No tubercle bacilli.

Brown Projection from Left Suprarenal.—Tubercle bacilli, seven seen.

Small Intestine:

Duodenum (Pink patch with raised margin).—Tubercle bacilli numerous.

Jejunum (Pink patch with raised margin).—Tubercle bacilli numerous.

Jejunum (Yellow caseous point in Peyer's patch). Two films examined.—Tubercle bacilli numerous.

Ileum (Ulcer from).—Tubercle bacilli numerous.

Ileum (scraping from mucous membrane between the ulcers).—No tubercle bacilli seen.

Large Intestine:

Ulcer, two films examined.—Tubercle bacilli numerous.

Scraping from Mucous Membrane between the Ulcers.—No tubercle bacilli seen.

CALF 481. (Virus H 30. "E.M.")

Subcutaneous—Inoculation of emulsion of lesions of Guinea-pigs 1336–1339.

Dose—3,756,800,000 tubercle bacilli.

Date—August 8th, 1904.

Weight at Inoculation—1 cwt. 0 qrs. 16 lbs.

Killed—December 9th, 1904. [123 days after inoculation.]

Clinical Notes.

The calf was inoculated on August 8th, 1904.

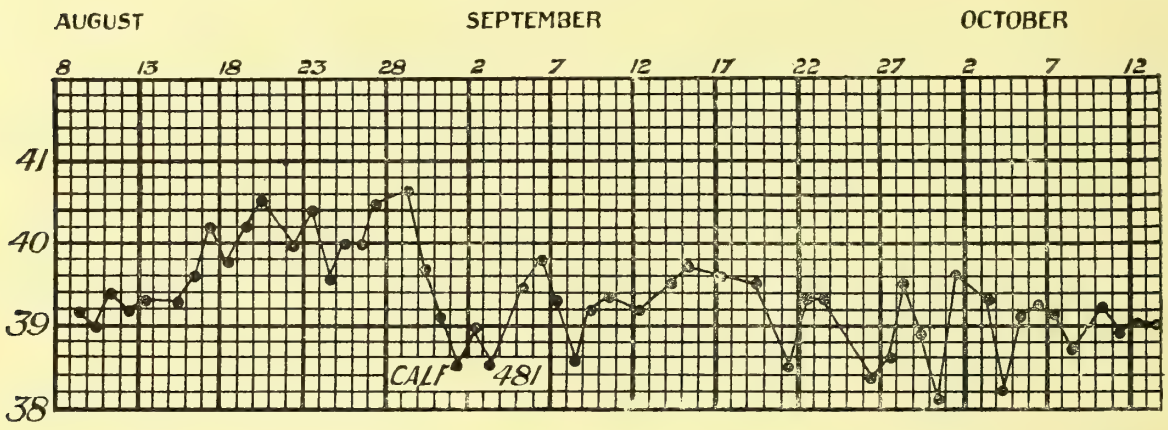
Fifteen days later there was a very large hot swelling measuring 6 in. by 9 in. at the seat of inoculation; the lower part of it was indefinite, merging into œdema which reached to the bottom of the dewlap. The right prescapular gland was considerably enlarged, 4 in. in length.

On August 29th, three weeks after injection, the tumour measured 8 in. by 5 in. and the prescapular gland was 5 in. long. The calf had been ill for some days, but was then better.

On September 26th, the tumour measused 9½ in. by 5 in., and showed a large dry ulcer. The prescapular gland was 4½ in. long. The general condition of the calf was slowly improving.

Early in October a large foul slough formed at the seat of inoculation, measuring 5 in. by 3 in. On 25th October it separated and fell off, leaving a ragged dry ulcer, over 1 in. in length. This ulcer rapidly healed, and had almost entirely closed when the calf was killed on December 9th, 1904, 123 days after inoculation. The animal had improved rapidly in appearance during November, and appeared quite well when killed.

Temperature.



After October the temperature remained practically normal.

Weights.

During the first three weeks the calf lost 7 lbs. After this it picked up, and grew well during September, October, and the greater part of November. From November 22nd to December 9th, when the calf was killed, it again lost weight (5 lbs.). The animal appeared quite well at the time, but the intestinal disease found after death may account for the loss of weight.

	cwt.	qrs.	lbs.	
August 8th, 1904	1	0	16	Inoculated.
August 30th, 1904	1	0	9	
September 14th, 1904	1	0	16	
September 17th, 1904	1	0	21	
October 11th, 1904	1	1	10	
October 25th, 1904	1	1	22	
November 8th, 1904	1	2	12	
November 22nd, 1904	1	2	22	
December 9th, 1904	1	2	17	Killed.

Total gain of weight during experiment.—2 qrs. 1 lb.

Average rate of gain per week.—3·2 lbs.

Tuberculin Tests.

No. I. September 12th. 35 days after inoculation. Reacted. Rise of temperature 1·3° C.

No. II. September 15th. 38 days after inoculation. Rise of temperature 1·1° C.

No. III. September 19th. 42 days after inoculation. Rise of temperature 0·2° C.

No. IV. September 23rd. 46 days after inoculation. Rise of temperature 0·5° C.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a scar, 3 or 4 in. in length, almost entirely healed, and with projections of skin on either side of it, like one sees in tuberculous scars. There was no tuberculous tumour, but the tissue around the scar, and from thence down to the dewlap, was dense and fibrous, and contained numerous little calcareous grains.

Right Prescapular Gland.—Was considerably increased in thickness, though not much in length; it measured 2½ in. by 1¾ in. by 1¼ in. The gland was extremely hard and nodular, partly composed of dense pink, caseo-necrotic tissue, which was lying partly loose in a cavity containing pus, and partly in contact with calcareous tissue, which elsewhere formed the wall of the abscess cavity.

Right Prepectoral Gland.—Contained a hard calcareous nodule of the size of a small pea.

Right Pectoral Gland.—Contained a calcareous focus.

Left Pectoral Gland.—Contained a single focus.

Axillary Glands.—Normal.

Thorax.

Pleura.—Normal.

Lungs.—Were normal, except that the apex of the left anterior lobe was collapsed and carnified. It was not tuberculous.

Thoracic Glands.—Were not enlarged. In the left bronchial a single minute calcareous focus was seen. The right was normal. The posterior thoracic gland, which was quite small, contained two minute foci.

Heart.—Normal.

Abdomen.

Peritoneum, Omentum.—Normal.

Intestines.—In all the Peyer's patches of the small intestine were rather numerous yellow points, the size of small pin's head. These were calcareous, and readily shelled out, and were surrounded apparently by normal gland tissue. In one Peyer's patch there was a nodule

$\frac{1}{8}$ in. in diameter, which caused an elevation of the peritoneal surface, as well as of the mucous membrane. It was firm and translucent.

In the jejunum were two prominent nodules, $\frac{1}{2}$ in. in diameter, considerably raised. In the centre of each was a small oval ulcer, with overhanging edges. The floor of the ulcer was raised considerably above the level of the surrounding mucous membrane, and on section was firm, and was seen to contain a brownish calcareous centre. On the corresponding serous surface the peritoneum was rough and thickened. (These differed considerably from the usual tuberculous ulcers, particularly in that the ulcer was situated on the top of a raised nodule.)

The large intestine was normal.

Mesenteric Glands.—Were extensively affected. In them could be felt hard nodules, in some about the size of peas, in others more diffuse, occupying considerable portions of the cortices of the glands. On section these nodules were found to be extensively calcified, consisting of yellow grains embedded in dense fibrous tissue. All the glands were affected.

Spleen.—Normal.

Liver.—On the surface of the liver were seen about six minute grey points, which were probably tubercles. On section nothing abnormal was seen. They were so small that it was extremely difficult to pick them out on the point of the knife, and they did not shell out cleanly, like little chronic tubercles usually do.

Hepatic Glands.—Contained a few minute calcareous foci.

Kidneys.—Normal.

Suprarenals.—Each contained one tubercle, which shelled out cleanly, and then appeared as a clear translucent little sphere about $\frac{1}{16}$th of an inch in diameter.

Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pubic.—Contained several calcareous foci.

Gluteal.—Contained a few calcareous foci.

Right Ischiatic.—Contained several calcareous foci.

Left Ischiatic.—Contained one focus.

Popliteal.—Contained several calcareous foci.

Submaxillary.—Each contained one or two foci.

Parotideal.—Right was normal. Left contained a single focus.

Pharyngeal, Hyoid.—Normal.

Tongue.—There was a small ulcer on the right hand side of the tongue (about $\frac{1}{4}$ in. in diameter, with raised edges), close to the palato-glossal folds.

Palate, Pharynx.—Normal.

(The corrugated extension of the dorsal wall of the pharynx was normal.)

Microscopical Examination.

Tubercle from Liver.—No tubercle bacilli.

Tubercle from Precrural Gland.—No tubercle bacilli.

Tubercle from Hepatic Gland.—No tubercle bacilli.

Tubercle from Mesenteric Gland.—Tubercle bacilli.

Tubercle from Suprarenal.—Tubercle bacilli.

Nodule from Peyer's Patch.—No tubercle bacilli.

Scraping from Intestinal Ulcer.—No tubercle bacilli.

CALF 593 (Virus H. 30. "E.M.")

Subcutaneous—Inoculation of culture derived from original material, through Guinea-pig 1337

Dose—50 milligrammes.

Date—December 20th, 1904.

Weight at Inoculation—1 cwt. 1 qr. 14 lbs.

Killed—March 18th, 1905. [88 days after inoculation.]

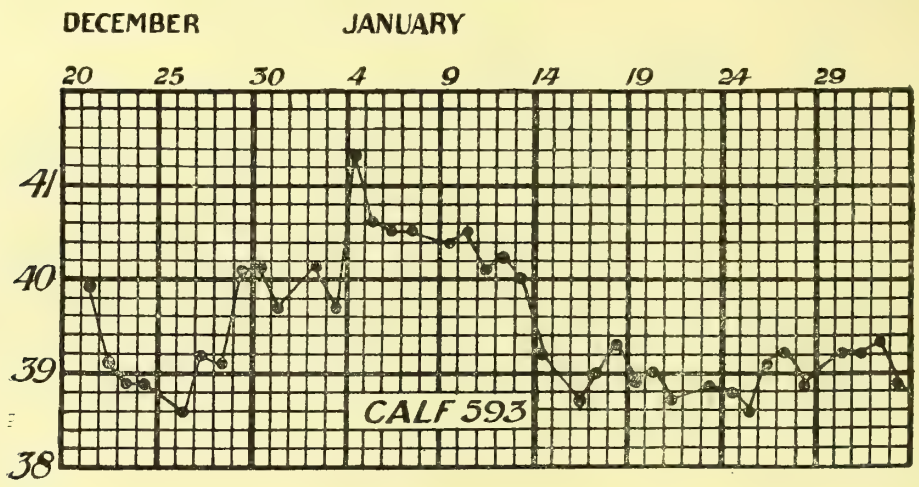
Clinical Notes.

The calf was inoculated on December 20th, 1904. A month later there was a large swelling at the seat of inoculation, measuring 8 ins. by 4½ ins. The right prescapular gland was enlarged, 4½ ins. long.

On January 31st, 1905, six weeks after inoculation, the swelling measured 6½ ins. by 3½ ins., and the prescapular gland 4 ins. by 2¼ ins.

On March 18th, 88 days after injection, the calf was killed. Apart from the usual constitutional disturbance following the inoculation, and coincident with the period of high temperature, the calf remained well during the experiment.

Temperature.



From February 2nd to March 18th, when the calf was killed, the temperature remained approximately normal.

Weights.

During the fortnight immediately following the inoculation the calf lost 3 lbs. Afterwards it gained weight steadily.

	cwt.	qrs.	lbs.	
December 20th, 1904	1	1	14	Inoculated.
January 3rd, 1905	1	1	11	
January 17th, 1905	1	1	19	
January 31st, 1905	1	2	2	
February 14th, 1905	1	2	14	
February 28th, 1905	1	2	23	
March 18th, 1905	1	3	10	Killed.

Total gain of weight during experiment.—1 qr. 24 lbs.

Average rate of gain per week.—4·1 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—The tumour at the seat of inoculation, on the right side of the neck, measured 6 ins. by 2½ ins. by 2 ins., and weighed 9 ozs. It did not infiltrate the skin or subjacent muscle. On section it was seen to be composed of salmon-pink caseo-necrotic tissue, slightly calcareous on its periphery, and containing large irregular cavities full of turbid serum.

Right Prescapular Gland.—Measured 2¾ ins. by 1½ ins. by 1⅛ in. It was composed principally of two large caseo-necrotic masses, which occupied almost the whole of the gland. It was slightly calcareous about the periphery.

Left Prescapular Gland.—Normal.

Prepectoral Glands.—The right was as large as a large pea and surrounded by an extrem ly thick pearly white capsule. The left was normal.

Pectoral Glands.—The right pectoral glands were normal.

Axillary Glands.—Normal.

Thorax.

Pleura.—Normal.

Lungs.—Careful search revealed the presence of several exceedingly minute barely visible tuberculous foci. They were circular in shape, dark grey in colour, slightly darker than the surrounding tissue, and the largest had an opaque central point.

Thoracic Glands.—Were scarcely at all enlarged. In several of them, including the posterior thoracic and the left bronchial, were found some minute calcareous foci.

Heart.—Normal.

Abdomen.

Peritoneum, Omentum, Intestines, Mesenteric Glands, Spleen.—Normal.

Liver.—On the surface of the liver close inspection revealed the presence of four or five minute ochre-coloured points, situated immediately beneath the capsule. A few others were found, more deeply seated.

Hepatic Glands, Kidneys, Suprarenals.—Normal.

Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pudic, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

Microscopical Examination.

Focus from Lung.—No tubercle bacilli seen.

Focus from Liver.—No tubercle bacilli seen.

CALF 599. (Virus H. 30. "E.M.")

Subcutaneous—Inoculation of culture derived from original material, through Guinea-pig 1337.

Dose—50 milligrammes.

Date—December 20th, 1904.

Weight at Inoculation—1 cwt. 1 qr. 1 lb.

Killed—March 18th, 1905. [88 days after inoculation.]

Clinical Notes.

The calf was inoculated on December 20th, 1904. A month later there was a small swelling at the seat of inoculation measuring 3½ in. by 2 in. The right prescapular gland was slightly enlarged.

The swelling did not increase in size; on February 14th, 8 weeks after inoculation, it measured 3 in. by 2½ in. The prescapular gland was then scarcely at all enlarged.

On March 18th, 88 days after inoculation, the calf was killed. It had remained perfectly well during the experiment.

Temperature.

There was a very slight rise of temperature shortly after inoculation. From February 2nd to March 18th, when the calf was killed, it remained normal.

Weights.

The calf gained weight steadily during the experiment though the rate of growth was somewhat slow.

	cwt.	qrs.	lbs	
December 20th, 1904 - -	1	1	1	Inoculated.
January 3rd, 1905 - - -	1	1	9	
January 17th, 1905 - -	1	1	13	
January 31st, 1905 - -	1	1	21	
February 14th, 1905 - -	1	2	1	
February 28th, 1905 - -	1	2	15	
March 18th, 1905 - - -	1	2	20	Killed.

Total gain of weight during experiment.—1 qr. 19 lbs.

Average rate of gain per week.—3·7 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—The tumour at the seat of inoculation measured 2 in. by 1 in. by ¾ in. It did not infiltrate the skin or subjacent muscle, and consisted of a fibrous wall with caseo-purulent contents.

Right Prescapular Gland.—Scarcely at all enlarged. Contained scattered calcareous foci and several small fibro-calcareous nodules.

Left Prescapular Gland.—Normal.

Prepectoral Glands.—The right was as large as a pea, and fibro-calcareous throughout. The left was normal.

Axillary Glands.—Normal.

Thorax.

Pleura, Lungs, Thoracic Glands.—Normal.

Abdomen.

Peritoneum, Omentum, Intestines.—Normal.

Mesenteric Glands, Spleen.—Normal.

Liver.—One minute doubtful focus was seen.

Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

Microscopical Examination.

Doubtful Focus from Liver.—No tubercle bacilli seen.

VIRUS H 31. "L.F."

CERVICAL GLANDS. (Operation.)

TABLE 31.

VIRUS H 31. "L.F."

HUMAN CERVICAL GLANDS.

September 25, 1904.



COW-CALF 485.
Subcutaneous.
Dose : 5,979,000 T.B.
Killed, February 23, 1905.
151 days.

P.M.—Infiltrating tumour. Prescapular gland enlarged, caseous and calcareous. Few caseo-calcareous tubercles in lungs and spleen, one in liver. Numerous calcareous tubercles in thoracic glands. (G.T. slight.)

GUINEA-PIGS.

1414	Died	36 days	Tuberculous Peritonitis.
1415		23 „	

RABBITS.

147	Died	107 days	G.T.
148	„	112 „	G.T. Injection subcutaneous.



BULL-CALF 491.
Subcutaneous.
Dose : 5,979,000 T.B.
Killed, February 24, 1905.
152 days.

P.M.—Large tubercles are fairly numerous in lungs, liver and spleen, and tuberculous plaques occur on pleura, diaphragm and surface of liver. (G.T. slight.)

TABLE 31A.

VIRUS H. 31 "L.F."

CERVICAL GLANDS.

CULTURE INOCULATIONS.

[I.] November 1, 1904.

Strain derived from human cervical glands, direct.

Total duration of artificial cultivation, 5 weeks.

Sub-culture used for injection, 21 days old, on pure serum.



COW-CALF 519.

Subcutaneous.

Dose: 50 mg.

Died: November 22, 1904.

21 days.

P.M.—General miliary tuberculosis, severe.

RABBITS.

184	0·1 mg.	D. 108 days	G.T. severe in lungs.
185	1·0 mg.	„ 47 „	G.T.



COW-CALF 521.

Subcutaneous.

Dose: 30 mg.

Killed when dying: December 7, 1904.

36 days.

P.M.—General tuberculosis, severe.

[II.] November 24, 1905.

Strain derived from human cervical glands, direct.

Total duration of artificial cultivation, 14 months.

11th subculture on pure serum used for injection, 21 days old.



BULL-CALF 947.

Subcutaneous.

Dose: 10 mg.

Died: February 4, 1906.

72 days.

P.M.—General tuberculosis, moderate.



COW-CALF 939.

Subcutaneous.

Dose: 10 mg.

Died: January 6, 1906.

43 days.

P.M.—General tuberculosis, severe.

GOAT 33.

Fed.

Dose: 1 mg.

Died: June 11, 1906.

199 days.

P.M.—Severe tuberculosis of alimentary tract and lungs. Abdominal organs very slightly affected.

GOAT 35.

Fed.

Dose: 10 mg.

Killed when dying, March 10, 1906.

166 days.

P.M.—Severe tuberculosis of alimentary tract and lungs. Abdominal organs less severely affected.

FOWLS.

1	10 mg.	Fed	K. 116 days	No Tuberculosis.
2	10 mg.	Intrap.	„ 112 „	

RABBITS.

690	10 mg.	D. 25 days	G.T.
691	10· „	„ 38 „	G.T. Injection partly intramuscular.
692	1· „	„ 31 „	G.T.
693	1· „	„ 26 „	G.T.

VIRUS H 31. "L.F."

L.F., a Male Child, aged Seven Years, Admitted to Hospital on September 21st, 1904, Suffering from Enlarged Glands on both Sides of the Neck. Operation: September 24th, 1904.

Family History.—There was no family history of tubercle.

Clinical History.—The child was fed in infancy on cows' milk and artificial food. No definite statement could be obtained as to the date when the enlarged cervical glands were first detected.

On admission a very large mass of enlarged glands could be detected on both sides of the neck, and some doubt was expressed as to whether this enlargement was due to tuberculous disease or lymphadenoma. No symptom of tuberculosis could be detected elsewhere.

The glands were removed by operation three days after admission. The wounds did not heal for a considerable period, one side of the neck not healing till Christmas, and the other remaining unhealed till the following March.

DESCRIPTION OF MATERIAL RECEIVED AT BLYTHWOOD.

Cervical Glands.—Two very large lymphatic glands and one small one. The largest measured 2 in. in length. On section all the glands were found to be riddled with cavities containing caseo-purulent material.

The contents of the cavities were scraped out, and made into an emulsion. The emulsion, on microscopical examination, showed large numbers of tubercle bacilli, which appeared to be rather shorter than usual.

Subsequent History of Patient.

The patient was visited fourteen months after the operation, and was then found to be much improved in health. The mother stated that after both sides of the neck had completely healed, one small gland could be detected on the left side.

An operation was performed for the removal of some adenoids and one tonsil, and after this the gland disappeared.

CALF 485. (VIRUS H 31. "L.F.")

Subcutaneous Inoculation of emulsion of human cervical glands.

Dose—5,979,000 tubercle bacilli.

Date—September 25th, 1904.

Weight at Inoculation.—1 cwt. 2 qrs. 4 lbs.

Killed—February 23rd, 1905. [151 days after inoculation.]

Clinical Notes.

The calf was inoculated on September 25th, 1904. Sixteen days later there was a flat hot swelling at the seat of inoculation, measuring 5½ in. by 3¾ in. by about 1¼ in. thick. The right prescapular gland was enlarged, 3½ in. long.

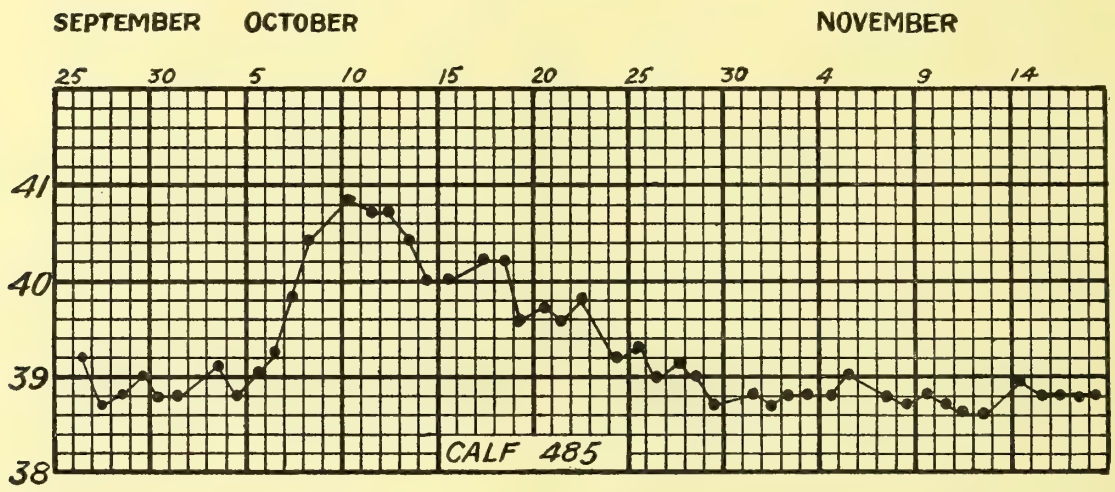
On October 25th, a month after inoculation, the swelling measured 6½ in. by 5 in. and the prescapular gland was very large, 5 in. in length.

The respiration appeared slightly accelerated, but the general condition of the calf was good.

Subsequently the swelling diminished a little in size, while the gland continued to increase. On February 14th, 1905, the former measured 6 in. by 4½ in. and the latter 6 in. by 3 in.

On February 23rd, 123 days after inoculation, the calf was killed. The general health had remained good during the experiment.

Temperature.



From November 18th to February 23rd, when the calf was killed (a period of four months), the temperature remained normal.

Weights.

The calf gained weight rapidly during the experiment.

	cwt.	qrs.	lbs.	
September 25th, 1904	1	2	4	Inoculated.
October 11th, 1904	1	2	16	
October 25th, 1904	1	3	0	
November 8th, 1904	1	3	11	
November 22nd, 1904	2	0	0	
December 6th, 1904	2	0	2	
December 20th, 1904	2	0	24	
January 3rd, 1905	2	0	25	
January 17th, 1905	2	1	17	
January 31st, 1905	2	2	2	
February 14th, 1905	2	2	25	
February 23rd, 1905	2	3	4	Killed.

Total gain of weight during experiment.—1 cwt. 1 qr.

Average rate of gain per week.—6·4 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Fat.

Local Lesion.—The tumour at the seat of inoculation on the right side of the neck, measured 5 in. by 3½ in. by 2½ in. It was adherent to the skin, which was not infiltrated, and it infiltrated the adjacent muscle with unusually large calcareous tubercles. Between the skin and the infiltrated muscle was three quarters of an inch of very tough fibrous tissue, which contained scattered calcareous grains.

Right Prescapular Gland.—Was much enlarged, and measured 4½ in. by 2½ in. by 2 in. It weighed 7 ozs. On section it was firm, and thickly infiltrated with calcareous deposit. It contained a salmon-pink irregular caseous patch, three quarters of an inch in diameter, and surrounded by a thick fibrous wall.

Just in front of the acromion process was a gland lying between the skin and superficial muscle, as large as a cherry, infiltrated with caseous deposit.

Left Prescapular Gland.—Normal.

Prepectoral Glands.—The right prepectoral gland was as large as a cherry, tough and fibrous, and infiltrated throughout with caseous deposit.

Pectoral Glands, Axillary Glands.—Normal.

Thorax.

Pleura.—Normal.

Lungs.—In the lungs were a good many little tubercles, each surrounded by a small amount of fibrous tissue. They varied in size up to an eighth, or even a sixth of an inch in diameter. They were caseo-calcareous, and readily shelled out. They were more numerous in the small anterior than in the large posterior lobes. Thirty-eight were counted on the surface of the right lung, and they appeared to be equally numerous on that of the left. A few only were found on section.

There was some slight hypertrophy of the lymphatic tufts, which gave some of the smaller lobes the appearance of being studded with minute tubercles.

Thoracic Glands.—Were slightly enlarged, and contained numerous yellow calcareous nodules, half an inch or a sixth of an inch in diameter.

Heart.—Normal.

Abdomen.

Peritoneum, Omentum, Intestines, Mesenteric Glands.—Normal.

Spleen.—Some tubercles were found of the size of a small shot, with yellow caseous and slightly calcareous centres.

Liver.—A single tubercle, about the size of a small shot, translucent, with an opaque yellow centre, was seen near the surface of the liver. No tubercles were found on section.

Hepatic Glands.—Contained some small calcareous foci.

Kidneys and Suprarenals.—Normal.

Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Special Glands.

Precrural.—The left contained a fibro-caseous nodule, three quarters of an inch in diameter. The right was normal.

Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

Microscopical Examination.

Tubercle from Lung.—No tubercle bacilli seen.

Tubercle from Liver.—One tubercle bacillus seen

Tubercle from Spleen.—Two tubercle bacilli seen.

CALF 491. (VIRUS H 31. "L.F.")

Subcutaneous Inoculation of emulsion of human cervical glands.

Dose—5,979,000 tubercle bacilli.

Date—September 25th, 1904.

Weight at Inoculation—1 cwt. 1 qr. 17 lbs.

Killed—February 24th, 1905. [152 days after inoculation.]

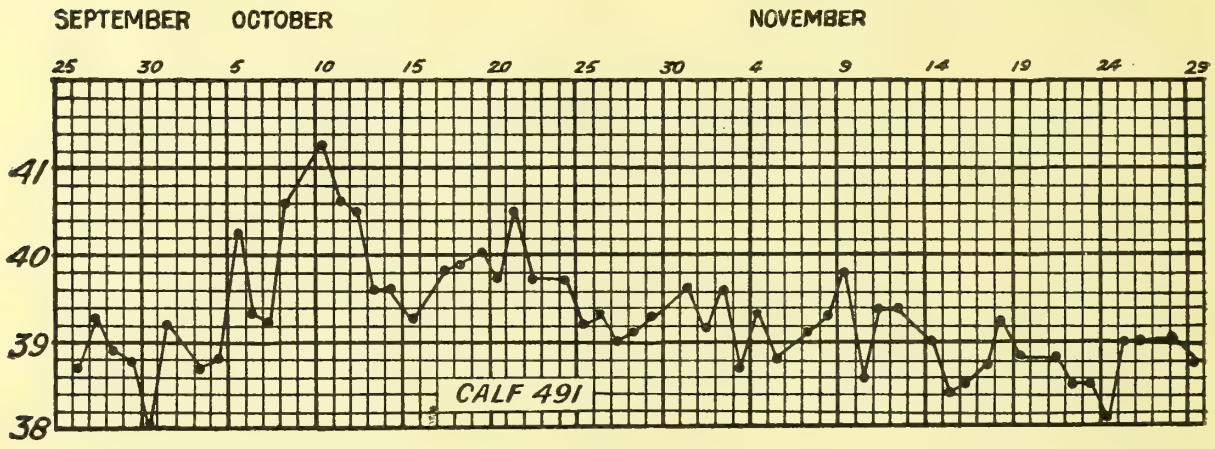
Clinical Notes.

The calf was inoculated on September 25th, 1904. Sixteen days later there was a flat hot swelling, measuring 6 in. by 3¼ in., at the seat of inoculation. The right prescapular gland was enlarged, 4 in. in length.

On October 25th, a month after inoculation, the swelling measured 7½ in. by 3½ in., by about 1½ in. thick. The prescapular gland was very large, 5½ in. long.

Both the local swelling and the prescapular gland continued to increase in size. On February 14th the former was large and pendulous, measuring 8 in. by 5½ in.; the latter measured 6 in. by 3½ in. On February 24th, 1905, 152 days after inoculation, the calf was killed. It was somewhat unwell for a fortnight at the commencement, when the temperature was high, and the local swelling developing, but it soon recovered, and remained apparently quite well during the remaining period of the experiment.

Temperature.



From December 1st to February 24th, when the calf was killed (a period of 2½ months), the temperature remained approximately normal.

Weights.

The calf gained weight steadily during the experiment.

	cwt.	qrs.	lbs.	
September 25th, 1904	1	1	17	Inoculated.
October 11th, 1904	1	2	2	
October 25th, 1904	1	2	11	
November 8th, 1904	1	2	25	
November 22nd, 1904	1	3	14	
December 6th, 1904	1	3	11	
December 20th, 1904	2	0	9	
January 3rd, 1905	2	0	11	
January 17th, 1905	2	0	26	
January 31st, 1905	2	1	19	
February 14th, 1905	2	2	10	
February 24th, 1905	2	2	15	Killed.

Total gain of weight during experiment.—1 cwt. 0 qr. 26 lbs.

Average rate of gain per week.—5·6 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—The tumour at the seat of inoculation, on the right side of the neck, was large and of the infiltrating variety. It measured 7 in. by 4 in. by 3 in., and weighed 1 lb. 7 ozs. The skin over it was thickened and adherent, and contained numerous rather large caseous tubercles. Beneath this the main part of the tumour, 1¾ in. in thickness, consisted centrally of a yellowish caseo-necrotic mass, immediately surrounded by a thick wall of dense white fibrous tissue, beyond which again it was dense and calcareous. The subjacent muscle was thickly infiltrated with large caseo-calcareous nodules.

Right Prescapular Gland.—Measured 4¼ in. by 2½ in. by 2½ in. It was very dense and calcareous, and contained several caseo-necrotic masses.

Left Prescapular Gland.—Normal.

Prepectoral Glands.—The prepectoral glands on the right side were two in number, each the size of a cherry, and were caseo-necrotic and partly calcified.

Pectoral Glands.—The right was enlarged, 1¼ in. It contained several caseous nodules.

Axillary Glands.—Normal.

Thorax.

Pleura, Diaphragm.*—On the costal pleura were a good many large lobulated outgrowths set along the lower margins of the second, third, fourth and fifth ribs on the right side, and the second, third, fourth, fifth and ninth ribs on the left side. These varied much in size, the largest being ⅝ in. in diameter. They were very prominent, movable, pinkish-grey in colour, and consisted of fleshy fibrous tissue containing caseous foci. About eight of these nodules appeared on the diaphragmatic pleura.

Lungs.—The lungs were studded with large tuberculous nodules, many of which projected from the surface, some being adherent to adjacent lobes or to the costal pleura. The majority were about the size of large peas, but a great many were ½ in., ⅝ in., or even more in diameter. These latter were flattened on the surface, and had raised margins and were lobulated, appearing to be

*See Plate 2.

formed by a confluence of several smaller nodules. They were numerous on the anterior and inferior portions of the lung, and especially on the little diaphragmatic lobe of the right lung. The lungs were nowhere consolidated, and collapsed well.

Thoracic Glands.—Were moderately enlarged, and contained numerous caseous and slightly calcareous nodules of various sizes, the larger a quarter of an inch or even half an inch in diameter, being composed of collections of tubercles.

Pericardium, Heart.—Normal.

Abdomen.

Peritoneum, Omentum.—On the diaphragmatic peritoneum on the right side there were many nodules similar to those on the pleura, the larger having coalesced, forming several large lobulated plaques an inch or two in diameter. Some of thse were adherent to tubercles situated on the falciform ligament of the liver. There were a good many tubercles in the great omentum.

There was a considerable quantity of fat in the omentum.

Intestines, Mesenteric Glands.—Normal.

Spleen.—Contained a considerable number of rather yellow caseous tubercles, twenty-nine being counted in a single longitudinal section.

Liver.—On the surface of the liver were several large fibro-caseous lobulated nodules with flattened surfaces and overhanging margins. Others, more deeply seated, caused prominences on the surface, through which they were faintly visible. There were about a dozen of these tubercles, and also a pale patch in the middle of the anterior surface, where there were numerous smaller nodules. Large spherical fibro-caseous nodules appeared in the substance of the organ, twelve of them, the largest more than half an inch in diameter, appearing in a single great section.

The falciform ligament was adherent to tubercles situated on the liver.

Hepatic Glands.—All contained small numbers of fibro-caseous tubercles of the size of small peas.

Kidneys.—Normal. There was a considerable quantity of fat around the kidneys.

Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural.—The right contained a fibro-caseous nodule the size of a pea. The left was normal.

Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

CALF 519. (VIRUS H 31. "L.F.")

Subcutaneous Inoculation of emulsion of culture derived from human cervical glands.

Dose—50 milligrammes.

Date—November 1st, 1904.

Weight at Inoculation—1 cwt. 1 qr. 26 lbs.

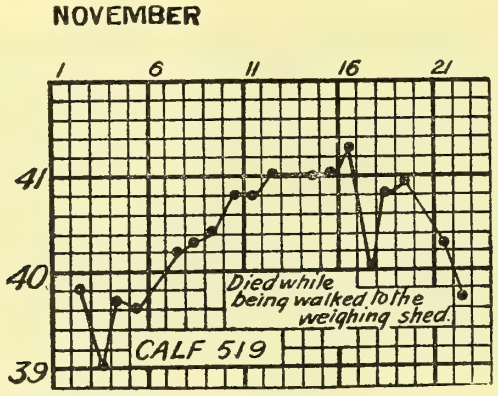
Died—November 22nd, 1904. [21 days after inoculation.]

Clinical Notes.

The calf was inoculated on November 1st, 1904. A fortnight later there was a hot and tense swelling at the seat of inoculation, measuring 6½ by 4 inches. The right prescapular gland was very large, 5 inches long; there was also slight œdema of the dewlap. The animal was unwell, and the temperature very high, 41·0° C.

On November 22nd, 21 days after inoculation, the calf died. During the week preceding it had been ill and thin, and had been breathing rapidly; on the 22nd it did not appear any worse than usual, but on being walked out of its box to be weighed, it fell down and expired, death being evidently due to difficulty of respiration.

Temperature.



Weights.

	cwt.	qrs.	lbs.	
November 1st, 1904 - -	1	1	26	Inoculated.
November 8th, 1904 - -	1	1	25	
November 22nd, 1904 - -	1	1	16	Died.

Total loss of weight during experiment.—10 lbs.

Average rate of loss per week.—3·3 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Thin.

Local Lesion.—At the seat of inoculation was a prominent tumour, 6 in. by 4 in. by 2 in. It infiltrated skin and subjacent muscle, and was composed of dense salmon-pink necrotic tissue, enclosing a large irregular cavity full of clear serum. Around the tumour was a large amount of œdema, extending below into the dewlap, and forwards as far as the jaw.

Right Prescapular Gland.—Was much enlarged, measuring 3½ in. by 2 in. by 1¾ in. It was firm, and consisted of dense pink necrotic areas, and of caseous striæ and networks enclosed in tough grey translucent tissue.

Left Prescapular Gland.—Normal.

Right Prepectoral Gland.—Was as large as a marble; it was caseous throughout.

Pectoral Glands.—The right pectoral gland was swollen, and contained a few tubercles. The hæmo-lymph glands in the neighbourhood were enlarged, and contained tubercles.

Axillary Glands.—Each contained a tubercle.

Cervical Glands.—The right deep cervical gland was enlarged, one and a half inches long. On section it was similar to the right prescapular.

Thorax.

Pleura.—Normal.

Lungs.—Were voluminous and heavy, and weighed 6 lbs. 8 ozs. They were dark pink in colour, especially in the anterior portions, where numerous small tubercles were visible on the surface. Section showed these small tubercles, which were just visible, thickly scattered everywhere throughout the lungs. More than half the organ was completely consolidated, and sank in water. There was no sharp line of demarcation between solid and air-containing parts.

Thoracic Glands.—Were much enlarged. They were firm, and full of caseating foci, but not so advanced as the right prescapular gland. The tissue of the dorsal mediastinum, as well as of the hilum of the posterior thoracic gland, was œdematous.

Heart.—The surface of both ventricles, especially of the conus arteriosus, was covered with minute hæmorhages. In the lining membrane of the vena cava superior a single tubercle could be seen close to the entrance of the auricle. The heart was otherwise normal.

Abdomen.

Peritoneum, Omentum.—Normal.

Intestines.—Normal.

Mesenteric Glands.—Contained an occasional tubercle.

Spleen.—The spleen contained some tubercles which were quite definite, and apparently very many more, but it was difficult to distinguish these from the Malpighian bodies.

Liver.—Numerous minute milk-white tubercles were seen on the liver. The majority of these were distinctly raised. Section showed them thickly scattered throughout the organ.

Hepatic Glands.—Were enlarged, and somewhat similar to the thoracic. The loose connective tissue round them was œdematous.

Kidneys.—A few tubercles could be seen in the kidneys, which were very congested.

Suprarenals.—Normal.

Renal Glands.—Each was full of tubercles.

Iliac Glands.—Each contained a few tubercles.

Genito-Urinary System.

Uterus.—Normal.

Mamma.—Normal.

Suprammary Glands.—Contained several tubercles.

Special Glands.

Precrural.—Right was full of tubercles; one was seen in left.

Gluteal, Popliteal.—Each contained a few tubercles.

Submaxillary.—Each contained a few tubercles. In the right they were numerous.

The subcutaneous œdema extended from the dewlap to the jaw, and separated the lobules of the submaxillary salivary glands.

Parotideal, Pharyngeal, Hyoid.—Each contained a few tubercles.

Tongue, Palate, Tonsils, Pharynx, —Normal.

CALF 521. (VIRUS H 31. "L.F.")

Subcutaneous Inoculation of emulsion of culture derived from human cervical glands.

Dose—30 milligrammes.

Date—November 1st, 1904.

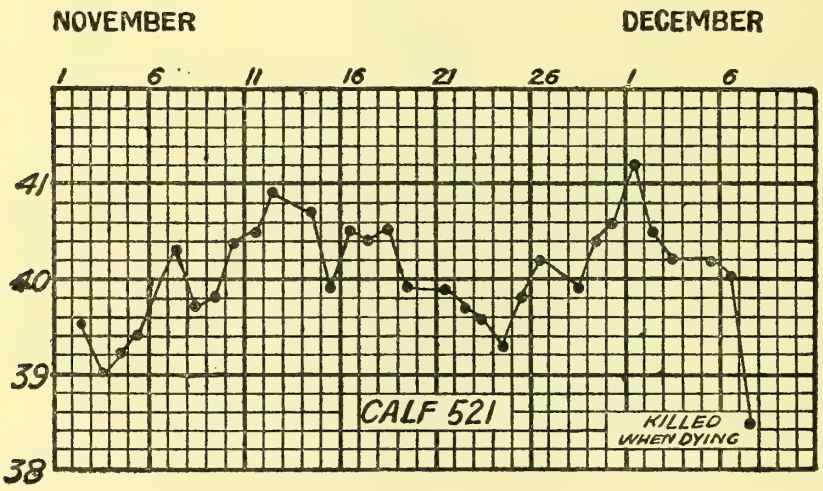
Weight at Inoculation—1 cwt. 1 qr. 7 lbs.

Killed when dying—December 7th, 1904. [36 days after inoculation.]

Clinical Notes.

The calf was inoculated on November 1st, 1904. A fortnight later there was a hot and tense swelling at the seat of inoculation, measuring 7 in. by 3½ in., with an indefinite continuation into the dewlap 10 in. in length. The right prescapular gland was considerably enlarged, about 4 in. long. The animal gradually became ill, and on December 3rd the respiration was for the first time observed to be quickened. The next day the calf was much worse, and on December 7th it was lying down, breathing heavily, and evidently in distress; the temperature showed the sharp fall of a degree and a half, which is usual in these cases before death. The calf was therefore killed, 36 days after inoculation.

Temperature.



Weights.

The calf lost nearly a fifth of its original weight during the experiment.

	cwts.	qrs.	lbs.	
November 1st, 1904 - -	1	1	7	Inoculated.
November 8th, 1904 - -	1	1	0	
November 22nd, 1904 -	1	1	4	
December 7th, 1904 - -	1	0	7	Killed when dying.

Total loss of weight during experiment.—1 qr.

Average rate of loss per week.—5·6 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Very thin.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a large tumour measuring 6½ in. by 4 in. by 2½ in., and weighing 1 lb. 2 ozs. It infiltrated skin and subjacent muscle, and between the two was a layer of tough yellowish-pink caseo-necrotic tissue. The subcutaneous tissue around the tumour was very œdematous.

Right Prescapular Gland.—Measured 4 in. by 2 in. by 2 in., and weighed 4 ozs. On section it was composed of firm salmon-pink caseo-necrotic patches, and yellowish-white striæ and islands, set in a small quantity of dense translucent brownish-pink tissue.

Left Prescapular Gland.—Was slightly enlarged, and contained many small yellow tubercles.

Right Prepectoral Gland.—Was as large as a marble. On section it was composed of salmon-pink caseating necrotic tissue throughout.

Right Pectoral Glands.—Were enlarged and soft. In their cortices were patches of yellow caseating foci.

Left Pectoral Glands, Axillary Glands.—Contained many small yellow tubercles.

Cervical Glands.—One deep cervical gland was enlarged, and its cortex was caseating throughout.

Thorax.

Pleura.—There was some hypertrophy of the natural fringes of the costal and diaphragmatic pleuræ. On the latter were some thin plaques of soft pinkish growth studded with minute yellow points, and lines of similar growth could be seen extending along the margins of some of the ribs.

Lungs.—The lungs were large, heavy, and congested, and weighed 6 lbs., 10 ozs. Nearly one half the organ was dark pink and airless. This included the anterior and the inferior portions. Other parts were mottled with dark airless lobules. Tubercles were numerous both on surface and section. They were very small, the largest, about an eighth of an inch in diameter, were seen on the surface of the solid portions of the lung. They were grey and opaque. In the air-containing parts they were surrounded by irregular square-shaped or angular consolidated areas which when separate averaged about an eighth of an inch in diameter, but which were usually more or less connected together, forming irregular islands and networks.

Thoracic Glands.—Were all greatly enlarged and congested. Their cortices were closely packed with yellow caseating foci. They were much softer than the prescapular gland. The mediastinal tissues in which they lay were extremely œdematous.

Pericardium, Heart.—Normal.

Abdomen.

Peritoneum, Omentum.—The omentum showed a considerable number of pink lenticular bodies loosely attached to it. There were probably a hundred or more of these,

the largest of which were about an eighth of an inch in diameter. On section the largest of them appeared mottled with caseous points, and they were undoubtedly tuberculous. Elsewhere the peritoneum, including that covering the diaphragm, was normal.

Intestines.—Throughout the small intestines were scattered little translucent tubercles with yellow centres. These were not confined to the Peyer's patches. They could easily be felt, and could be seen from both surfaces.

Tubercles similar to those in the small intestine were numerous in the cæcum. The mucous membrane at the commencement of the large intestine was swollen, and contained a few tubercles; some of them showed a zone of congestion. After this none were seen for a considerable distance, but they reappeared as the rectum was approached, and in these, when examined under water, slight superficial ulceration could be seen.

Gastric Glands.—There were some large lymphatic glands near the cardiac end of the stomach, the cortices of which contained many firm and translucent grey patches packed with minute caseating foci.

Mesenteric Glands.—Similar patches occurred in all the mesenteric glands, in some of which the cortices were almost entirely occupied with these patches. Some glands along the large intestine were similarly affected.

Spleen.—The surface of the spleen was somewhat nodular, and the nodules were hard to the touch. On section the texture of the organ was coarser than normal, and seemed to be made up of dense spherical nodules about a sixth of an inch in diameter, of the usual spleen colour, with little tissue between binding them together. In the centre of each nodule was a small yellow focus. Thus each Malpighian body appeared to be greatly hypertrophied, and to contain a tuberculous focus in its centre.

Liver.—The liver was studded with numerous tubercles, a few of which were about an eighth of an inch in diameter, the majority being about the size of pin's heads. Many of them projected above the surface. Section showed numerous little greyish-white tubercles scattered throughout the organ.

Hepatic Glands.—Were enlarged, and had their cortices crowded with caseating foci.

Kidneys.—The kidneys contained a moderate number of small tubercles in their cortices and on the surface. Several could be counted in some of the lobules, while almost all contained one or more.

Suprarenals.—One small tubercle was seen in each, situated in the cortex.

Renal Glands.—Were packed with tubercles.

Lumbar Glands, Iliac Glands.—Contained many small yellow tubercles.

Genito-Urinary System.

Uterus.—Normal.

Mammary Gland.—Two small tubercles were seen.

Suprammary Lymphatic Glands.—Contained numerous tubercles.

Special Glands.

Precrural.—Contained many small yellow tubercles.

Gluteal.—Each showed a few tubercles.

Ischiatic.—Right contained one tubercle. Left, very minute, was normal.

Popliteal.—Contained many small yellow tubercles.

Submaxillary and Parotideal Glands.—Those on the right side were packed with tubercles.

The glands on the left side were similar, but the tubercles were less numerous.

Pharyngeal Glands.—Both pharyngeal glands were packed with tubercles.

Hyoid Glands.—Those on the right side were packed with tubercles.

The glands on the left side were similar, but the tubercles were less numerous.

Tongue, Palate.—Normal.

Tonsils.—One or two tubercles were seen in the left tonsil. The right was normal.

Pharynx.—Several tubercles were found in the thick corrugated mucous membrane which proceeds from the nose on to the dorsal wall of the pharynx.

Nose.—A few tubercles also occurred in the mucous membrane of the septum of the nose; they were absent in other parts of the nasal cavities.

Eyes.—Normal.

Brain.—Appeared normal, as far as the damage done by the bullet permitted examination.

Microscopic Examination.

Tubercle from Mucous Membrane of Naso-Pharynx.—Tubercle bacilli.

Tubercle from Tonsil.—Tubercle bacilli.

Tubercle from Small Intestine.—Tubercle bacilli.

Tubercle from Cæcum.—Tubercle bacilli few.

Tubercle from Large Intestine near Rectum.—Tubercle bacilli few.

Tubercle from Mammary Gland.—Tubercle bacilli.

CALF 947. (Virus H 31. 'L.F.')

Subcutaneous Inoculation of culture derived from human cervical glands.

Dose—10 milligrammes.

Date—November 24th, 1905.

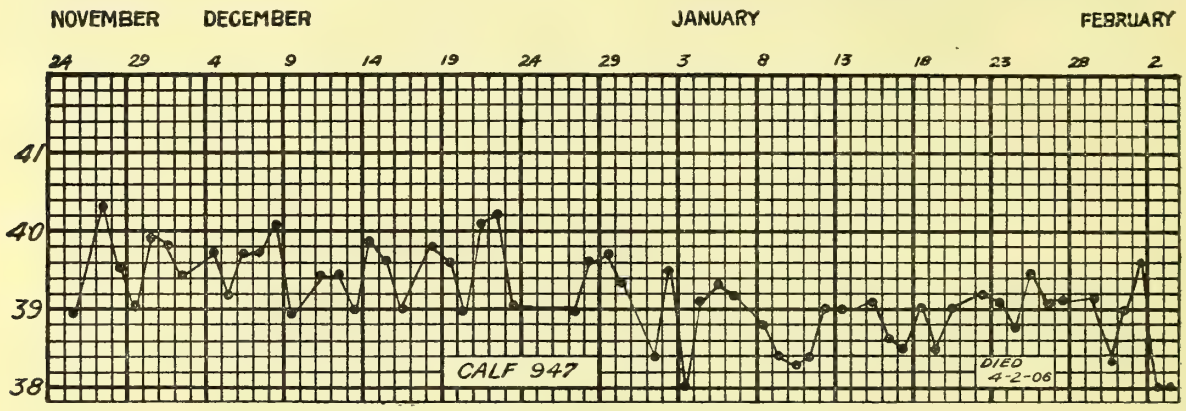
Weight at Inoculation—1 cwt. 0 qrs. 9 lbs.

Died—February 4th, 1906. [72 days after inoculation.]

Clinical Notes.

The calf was inoculated on November 24th, 1905. On February 4th, 1906, 72 days after inoculation, it died. The course of the disease was similar to that generally seen in calves suffering from acute tuberculosis, but its progress was slower than usual.

Temperature.



Weights.

There was no appreciable decrease of weight during the experiment.

	cwt.	qr.	lbs.	
November 24th, 1905 - -	1	0	9	Inoculated.
February 4th, 1906 - -	1	0	5	Died

Total loss of weight during experiment.—4 lbs.

Tuberculin Test.

The calf was not tested during the experiment.

POST-MORTEM EXAMINATION.

General Condition.—Thin.

There was a flat solid tumour at the seat of inoculation, which measured 4½ in. by 3 in. by 1¼ in., and weighed 7 ozs. It was composed of dense fibro-necrotic tissue which infiltrated skin and subjacent muscle, and surrounded an irregular central cavity with serous contents.

The Right Prescapular Gland.—Was enlarged, measuring 3 in. by 1¾ in. by 1½ in., and weighing 2 ozs. It was composed of dense fibrous necrotic tissue of uniform pinkish colour, and it showed no yellow points or streaks as is usual, and in this respect resembled many of the tuberculous prepectoral rather than prescapular glands.

The Left Prescapular Gland.—Contained one or two caseating tubercles.

The Right Prepectoral Gland.—The size of a large pea, had its cortex infiltrated with opaque caseating points.

The Right Axillary Gland.—Contained one or two caseating tubercles. The left was normal.

Thorax:

The Pleura.—There were a few small tubercles on the costal pleura and on the diaphragm.

The Lungs were large and heavy, and together weighed 6 lbs. 7 ozs. They were of a dark reddish colour, and almost entirely airless. Here and there along the posterior margins, and on the dorsal surfaces, small well-defined bright-red areas of irregular shape were the only air-containing portions visible. The surface of the lung was thickly studded with irregular grey tubercles from ⅛ in. to ⅓in. in diameter. Section showed the lung to be very firm and to be chiefly composed of irregular masses of confluent tubercles, many of them forming compact yellowish masses, often measuring ¼ in. or more in each diameter.

The intervening tissue was partly dark red and consolidated, and partly consisted of small brighter red air-containing areas. The anterior parts were entirely solid. The peribronchial glands were large and caseous.

The Bronchial and Mediastinal Glands were much enlarged and firm, and together weighed 7 ozs. The posterior mediastinal gland measured 5¾ in. by 1¾ in. by 1 in., and weighed 3 ozs. Their cortices were composed of dense whitish tissue somewhat resembling soap, and here and there was an irregular whiter point, which was not calcareous.

The Heart.—The right auricle was normal.

The right ventricle showed one rather large prominent yellow tubercle on the septum.

The left side of the heart was normal.

Abdomen:

Peritoneum and Omentum.—There were a few small tubercles on the omentum. Peritoneum normal.

Intestines.—A few suspicious foci only were seen in the small intestine. (Microscopical examination, tubercle bacilli, numerous.) The large intestine was normal.

The Mesenteric Glands were not obviously enlarged, but they almost all contained large prominent irregular caseating nodules.

The Spleen was not enlarged and contained a moderately large number of shot-sized tubercles.

Liver.—There were a dozen or more small tubercles seen on the surface, and one larger compound tubercle with a translucent grey overhanging margin. Only a few inconspicuous tubercles were seen on section.

The Portal Glands were enlarged, and their cortices packed with more or less confluent caseous tubercles.

Kidneys.—The surface of each kidney was peppered with a large number of minute inconspicuous tubercles and one or two large ones. Very few tubercles only could be seen on section.

The Suprarenals contained no definite tubercles, but they were rather large and showed some denser points between the cortex and the medulla, and not in the cortex itself, the usual seat of tubercle in the calf.

The Renal and Lumbar Glands were large, and consisted principally of confluent caseous tubercles.

The Iliac Glands contained one or two caseating tubercles.

The Tongue and Palate were normal.

There was a single tubercle in the corrugated mucous membrane of the *naso-pharynx*, and one in the right *Tonsil*. The left *Tonsil* was normal.

Larynx.—There was a tubercle just posterior to the apex of the left arytenoid.

The Trachea was normal.

Testes.—Normal.

Eyes.—There was a tubercle in the ciliary region of the choroid of each eye.

Various Lymphatic Glands.

The Right Precrural, Popliteal, and Pubic Glands contained one or more caseating tubercles.

The Left Precrural, Gluteal and Ischiatic Glands were normal.

The Right Hyoid Gland was caseating almost throughout its cortex.

The Left Hyoid, the Post Pharyngeal, Subparotid, and Submaxillary Glands contained rather large caseating tubercles. The left submaxillary was more severely affected than the others.

Microscopical Examination.

Suspicious foci from Small Intestine.—Tubercle bacilli, numerous.

Suspicious foci from Suprarenal.—No tubercle bacilli.

CALF 939. (Virus H 31. "L.F.")

Subcutaneous Inoculation of culture derived from human cervical glands.

Dose—10 milligrammes.

Date—November 24th, 1905.

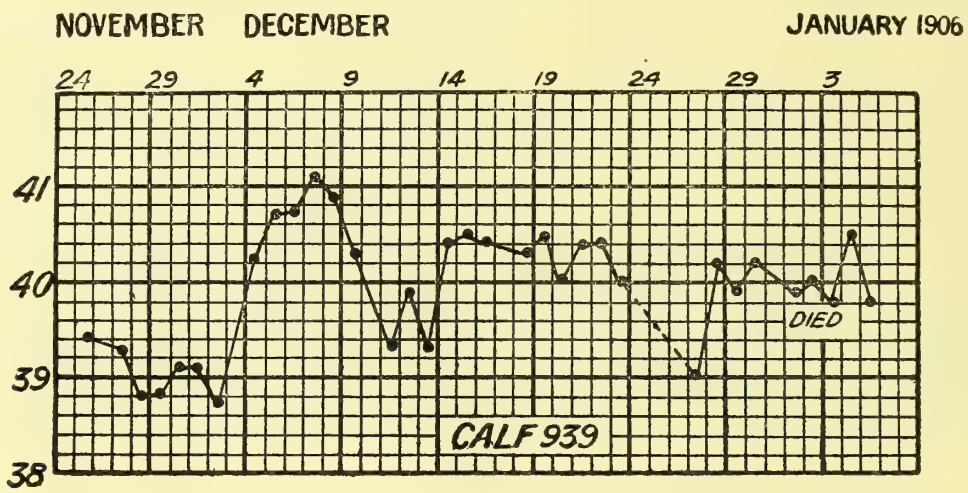
Weight at Inoculation—1 cwt. 0 qrs. 5 lbs.

Died—January 6th, 1906. [43 days after inoculation.]

Clinical Notes.

The calf was inoculated on November 24th, 1905. On January 6th, 1906, 43 days after inoculation, it died. The course of the disease was similar to that usually seen in calves suffering from acute tuberculosis.

Temperature.



Weights.

The loss of weight was not so great as is usual in rapidly fatal cases.

	cwts.	qrs.	lbs.	
November 24th, 1905 - -	1	0	5	Inoculated.
January 6th, 1906 - -	0	3	20	Died.

Total loss of weight during experiment.—13 lbs.

Average rate of loss per week.—2 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Thin.

Local Lesion.—There was a large solid tumour at the seat of inoculation, which measured $6\frac{1}{2}$ in. by $4\frac{1}{2}$ in. by $2\frac{1}{4}$ in., and weighed 1 lb. 2 ozs. It was composed of dense fibro-necrotic tissue, and infiltrated skin and subjacent muscle, and there was a good deal of œdema in the connective tissue around it.

Right Prescapular Gland.—Was enlarged. It measured $4\frac{1}{4}$ in. by 2 in. by $1\frac{3}{4}$ in., and weighed 4 ozs. It was hard and caseo-necrotic throughout.

Left Prescapular Gland.—Contained a few irregular tubercles. They were in an early stage of caseation, just becoming opaque, and were surrounded by congestion.

Right Prepectoral Gland.—Was enlarged, the size of a pigeon's egg, and similar in structure to the right prescapular.

Right Axillary Gland.—Resembled the left prescapular.

Left Axillary Gland.—Normal.

Thorax.

Pleura.—Normal.

Lungs.—Were voluminous, and weighed 5 lbs. 2 ozs. The anterior and inferior parts were dark red in colour and airless, and had a finely nodular surface, caused by the projection of innumerable little reddish grey tubercles.

Section showed the organ to be of a dark reddish colour and consolidated almost throughout. Everywhere there were thickly scattered little grey tubercles of irregular outline, and here and there in the right lung a sharply defined lobule was seen, denser than the rest, which presented a finely mottled greyish appearance.

Trachea.—Normal.

Thoracic Glands.—Were much enlarged, and weighed altogether 6 ozs. The largest measured $4\frac{3}{4}$ in. by $1\frac{3}{4}$ in. by $\frac{5}{8}$ in., and weighed 2 ozs.

They were moderately firm and elastic, greyish pink in colour, and showed only sparsely scattered caseous foci. One of them, the right bronchial, was more affected than the rest, and a good deal of its cortex was caseo-necrotic, like that of the right prescapular gland.

Heart.—Normal.

Abdomen.

Peritoneum, Omentum.—On the omentum there were a few small tubercles.

Intestines.—The small intestine showed only a few scattered yellow points in some of the Peyer's patches, which were more easily seen from the peritoneal than from the mucous surface.

Large intestine normal.

Mesenteric Glands.—Were all affected, being swollen and firmer than normal, and the cortex was everywhere dense and in many places grey and translucent, and mottled with caseous foci.

Spleen.—Was not enlarged. It contained a moderately large number of tubercles, smaller and greyer than usual.

Liver.—On the surface of the organ were a good many pearly grey tubercles, varying in size up to an eighth of an inch in diameter. A very large number of little whitish tubercles could also be seen through the capsule. Similar tubercles were found thickly scattered throughout the whole organ. They did not exceed a millimetre in diameter, and many were very much smaller. They were quite grey, and showed no central opacity.

Hepatic Glands.—Were much enlarged, and their cortex was nodular, composed of grey tissue with irregular caseating foci.

Kidneys.—On stripping off the capsule numerous little grey tubercles could be seen scattered over the organs, sometimes gathered together into little clusters. On section similar tubercles were seen, but they were less numerous.

Suprarenals.—In the suprarenals were a small number of grey tubercles.

Renal Gland.—Was enlarged, and packed with grey tubercles, with here and there an opaque centre.

Lumbar Glands.—Were similar, but less severely affected.

Iliac Glands.—Contained each a few tubercles, similar to but smaller than those in the posterior pharyngeal.

Genito-Urinary System.

Uterus, Mammary Gland.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Left Ischiatic, Popliteal.—Contained each a few tubercles, similar to, but smaller than those in the posterior pharyngeal.

Right Ischiatic Gland.—Normal.

Submaxillary, Parotideal, Posterior Pharyngeal, Right Hyoid.—Contained rather numerous large irregular tubercles. They were in an early stage of caseation, just becoming opaque, and were surrounded by congestion.

Left Hyoid.—Contained only one tubercle.

Tongue, Palate, Tonsils, Pharynx, Larynx.—Normal.

Eyes.—Normal.

Microscopical Examination.

Foci from Small Intestine.—Tubercle bacilli numerous.

GOAT 33. (Virus H. 31. "L.F.")

Fed—With emulsion of culture derived from human cervical glands.

Dose—1·0 milligrammes.

Date—November 24th, 1905.

Weight—At commencement of experiment, 2 qrs. 7 lbs.

Died—June 11th, 1906. [199 days after feeding.]

Clinical Notes.

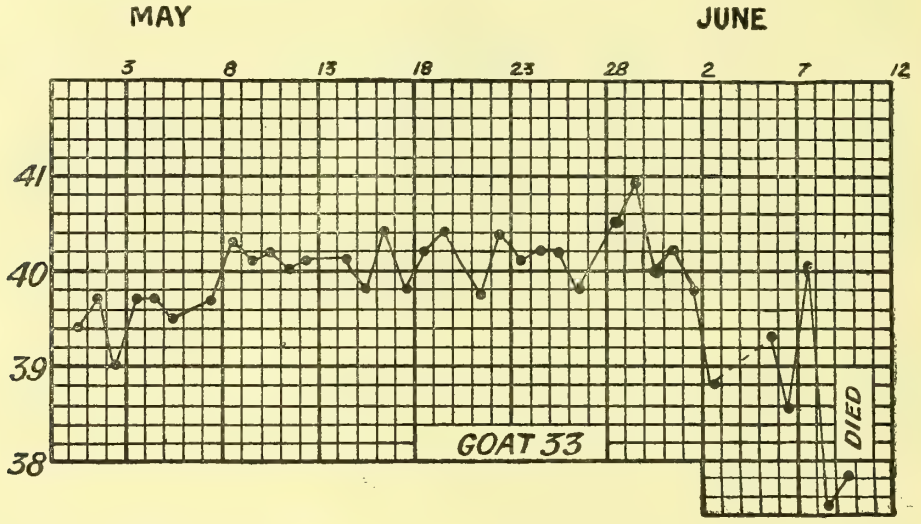
The animal was fed on November 24th, 1905. It remained apparently well with approximately normal temperature, for over three months.

On March 7th, 1906, it gave birth to two kids, which were born dead. (These were examined, and no tuberculous lesions found in them.)

The temperature then slowly rose, reaching 40·3°C. on May 8th, two months after parturition. The goat was at this time noticed to be very thin, and the respiration was quickened. It rapidly grew worse, becoming extremely emaciated, and died on June 11th, 199 days after feeding.

Temperature.

From the commencement of the experiment to the end of April the temperature did not vary much, remaining practically at about 39°C. The remainder of the temperature chart is shown below.



Weight.

	qrs.	lbs.
November 24th, 1905 - - -	2	7

The animal at death was greatly emaciated, but its weight was not recorded.

Tuberculin Test.

The goat was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Very emaciated.

Tongue, Pharynx.—Normal.

Submaxillary Glands.—The right submaxillary glands, two in number, were much enlarged and entirely caseous and softened. The left contained a caseous nodule about half an inch in diameter.

Parotideal Glands.—The right was normal. The left had a caseous nodule.

Posterior Pharyngeal Glands.—Were enlarged, and contained fibro-caseous nodules.

Abdomen.

Small Intestine.—The small intestine was riddled with ulcers of various sizes and shapes, some an eighth of an inch in diameter, while others formed irregular patches with a longitudinal diameter of half an inch. Some almost entirely encircled the gut. The margins were thickened; the floor, which often showed little grains of caseous matter, was in many of them so thin that it consisted of peritoneum only. In many cases this had been torn through the cleaning of the intestine, but no perforation seemed to have taken place during life, for there was no peritonitis.

Large Intestine.—In the large intestine also there were large deep-seated ulcers.

Gastric Glands.—The glands on the rumen were enlarged, caseous and calcareous.

Mesenteric Glands.—Were much enlarged. About half a dozen of them were as large as a pigeon's or even a bantam's egg, and many more as large as a blackbird's egg. They were caseous throughout, rather soft, and their marginal parts were more or less calcified. All the glands were affected.

Peritoneum, Omentum.—Were normal.

Pancreas.—Apparently normal.

Spleen.—Apparently normal.

Liver.—In the liver were about two dozen very irregular tubercles, none of which exceeded an eighth of an inch in diameter. They were yellowish-white in colour, and slightly calcareous. Besides these there were a good many little indefinite foci, which might have been tuberculous.

Portal Glands.—Contained numerous small caseous foci.

Kidneys, Suprarenals.—Were apparently normal.

Renal Glands.—Were normal.

Cœliac Glands.—Were enlarged, and were almost entirely caseous and rather extensively calcified.

Iliac Glands.—Normal.

Thorax.

Pleura.—Normal.

Lungs.—Were packed with caseous tubercles, most of which seemed to be a quarter to half an inch in diameter, but many of them had run together, and formed irregular patches. These tubercles were extensively caseous, their centres had softened, and in many cases they contained empty cavities, especially those near the posterior end of the lung. The intervening lung substance was congested, and immediately around the caseous patches consolidated. The anterior lobes were extensively consolidated, but were mottled by islands formed by emphysematous lobules.

Thoracic Glands.—Contained a few caseo-calcareous tubercles about a sixth of an inch in diameter, well defined and irregular in shape.

Heart.—Normal.

Genito-Urinary System.

Uterus.—Normal.

Special Glands.

Precrural, Popliteal.—Normal.

GOAT 35. (Virus H 31. "L.F.")

Fed with emulsion of culture derived from human cervical glands.

Dose—10 milligrammes.

Date—November 24th, 1905.

Weight at commencement of experiment—2 qrs. 14 lbs.

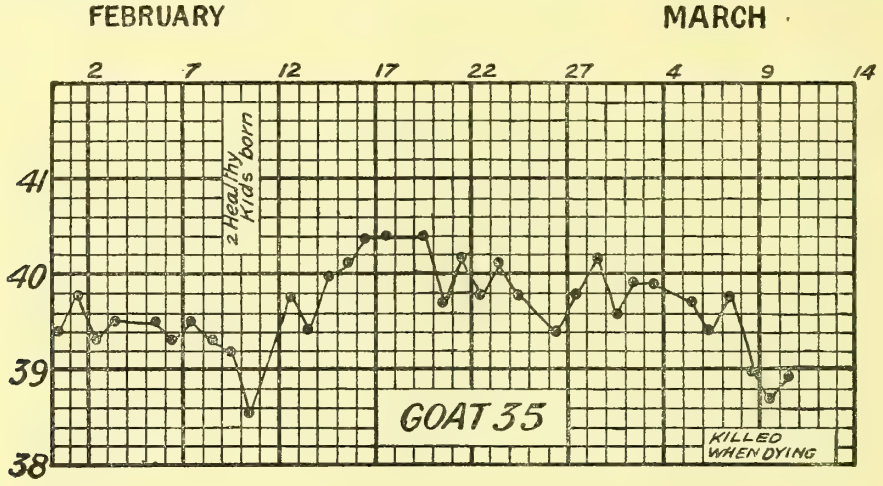
Killed when dying—March 10th, 1906. [106 days after commencement.]

Clinical Notes.

About the middle of February, nearly three months after the commencement of the experiment, the goat gave birth to two healthy kids. Before this she had not shown any marked signs of ill-health, but afterwards rapidly became ill and was apparently dying when killed 106 days after the feeding.

Temperature.

The temperature gradually rose during December and January. After the birth of the kids it rapidly rose, and remained high until death (*see* Chart).



Weights.

	qrs.	lbs.
At commencement of the experiment	2	14
At death	1	18

Total loss of weight—24 lbs.

POST-MORTEM EXAMINATION.

General Condition.—Thin.

Tongue.—Normal.

Tonsils.—Both tonsils were hard to the touch, and packed with little caseous tubercles, which had a tendency to become confluent.

Pharynx.—The mucous membrane of the pharynx was normal.

Larynx.—Normal.

Left Submaxillary Gland.—Was greatly enlarged and caseous, and as large as a blackbird's egg. Caseation was more advanced than elsewhere, and in many places there was commencing softening.

Right Submaxillary Gland.—Was similar, but smaller.

Left Parotid Gland.—The left parotid gland was similar in structure to the left submaxillary. On section it was as large as a penny.

Right Parotid Gland.—Was normal.

Pharyngeal Glands.—The post-pharyngeal lymphatic glands, four in number, were very large. One was the size of a blackbird's egg, another still larger, but flatter, two somewhat smaller. They were solid and caseous throughout, but mottled here and there with the remains of the original gland tissue.

Thyroid.—Normal.

Abdomen.

Stomach.—There were several small ulcers in the stomach.

The mucous membrane of the œsophagus was normal.

Intestines.—The small intestine was extensively ulcerated from one end to the other. Many of the ulcers were quite small, showed yellow bile-stained edges, and had thickened margins; but a large number were large, half an inch or even an inch or more in diameter, very deep and irregular in outline, and contained scraps of yellow slough. Many were so deep that their bases were formed only of peritoneum, and readily ruptured when they were disturbed, so that when they came to be examined large numbers of ulcers seemed to have perforated. This, however, was not the case, for there was no sign of peritonitis.

The large intestine and cæcum were similarly affected.

Mesenteric Glands.—Were very large, and together with the mesentery weighed 8 oz. One was as large as the kidney of this animal, and half a dozen were as large as pigeon's eggs. The cortex of these glands was solid and caseous, the medulla was still soft and brownish, and contained chyle: the caseous points, as in the post-pharyngeal glands, were firm, greyish-yellow, sparsely studded with irregular brighter points of more advanced caseation. The peritoneum over the largest gland was studded with small tubercles. Elsewhere on the mesentery tubercles were sparsely scattered.

Peritoneum, Omentum.—The omentum and the somatic peritoneum were normal.

Cœliac Glands.—Four in number, were greatly enlarged, and similar to the mesenteric.

Spleen.—Was not enlarged. No tubercles were visible on the surface. About half a dozen could be felt between the finger and thumb. These were found to be solid, yellowish-grey, the largest the size of large shot, each with a little bright centre.

Liver.—On the surface of the liver about half a dozen yellow tubercles could be seen, the largest about an eighth of an inch in diameter. There were in addition a large number of smaller ones, and numerous minute points, which were probably small tubercles. Only a few tubercles were visible on section.

Hepatic Glands.—Were moderately enlarged, and contained caseous tubercles of the size of small shot.

Kidneys.—Many minute and somewhat indefinite pale specks were seen on the surface of each kidney. There were no undoubted tubercles.

Suprarenals.—Were large and pale, the cortex thick, and marked with pale radial streaks. No tubercles were seen.

Renal Glands, Lumbar Glands.—Were enlarged, and their cortices studded with irregular tubercles.

Thorax.

Pleura.—Normal.

Lungs.—The lungs were moderately thickly studded with tuberculous nodules of various sizes. There was plenty of functional tissue between. The nodules were yellow tubercles, single or compound, surrounded by a narrow irregular dark grey margin. They varied in size from a sixteenth to a quarter of an inch, but along the dorsal border were larger elongated nodules of a greyish colour, some an inch in diameter. These on section were rather superficial, being about a quarter of an inch in thickness, and were grey and mottled with caseous streaks and foci.

On section the lung was moderately thickly packed with tubercles of various sizes, up to that of a small pea. The largest of these were commencing to soften.

Trachea.—Normal.

Thoracic Glands.—The post-mediastinal glands were enlarged. Their cortices were studded with irregular tubercles, some a quarter of an inch in diameter.

Heart.—Normal.

Genito-Urinary System.

Uterus, Mamma, Supramammary Glands.—Normal.

Special Glands.

Prescapular.—Normal.

Microscopical Examination.

Ulcer from Small Intestine.—Tubercle bacilli.

VIRUS H 32. "Y.W."

LUNG, BRONCHIAL GLANDS and MESENTERIC GLANDS. (Post-mortem.)

TABLE 32.

VIRUS H. 32. "Y.W."

October 1st 1904.

LUNG.



BULL-CALF 533.
Subcutaneous.
Dose: 654,160,000 T.B.
Killed, when dying, November 5, 1904.
35 days.
P.M.—General tuberculosis, severe.

RABBITS.

163	Died	13 days	Some acute infection.
164	Died	5 days	

RAT.

32	Died	424 days	General dissemination of tubercle bacilli.



COW-CALF 537.
Subcutaneous.
Dose: 654,160,000 T.B.
Killed, when dying, November 3, 1904.
33 days.
P.M.—General tuberculosis, severe.

BRONCHIAL GLAND.

RABBITS.

165	Died	18 days	Tuberculous peritonitis.
166	Killed when dying	97 days	G.T.

MESENTERIC GLAND.



BULL-CALF 487.
Subcutaneous.
Dose: 2,348,400,000 T.B.
Killed, when dying, October 23, 1904.
22 days.
P.M.—General tuberculosis, severe.

RABBITS.

167	Died	3 days	Some acute infection.
168	Died	12 days	An acute infection and tuberculous septicæmia.



BULL-CALF 465.
Subcutaneous.
Dose: 1,174,200,000 T.B.
Killed, when very ill, November 9, 1904.
39 days.
P.M.—General tuberculosis, severe.

E. of Prescapular Gland.

RABBITS.

182	Died	71 days	G.T. Injection S. subcutaneous.
183	Died	57 days	T. of lungs and kidneys. Injection S. subcutaneous.

GOAT 7. NANNY.
Subcutaneous.
Dose: 155,150,000 T.B.
Killed November 19, 1904, when very ill.
27 days.
P.M.—General tuberculosis, severe.

TABLE 32A.

VIRUS H 32. "Y.W."

CULTURE INOCULATION.

December 22, 1904.

MESENTERIC GLANDS.

Strain derived from human mesenteric glands, direct.

Total duration of artificial cultivation : nearly 3 months.

Subcultures used : on pure serum, 21 days old, and on glycerin-serum, 42 days old.



BULL-CALF 587.
Subcut.
Dose : 50 mg.
Died : January 26, 1905.
35 days.
P.M.—General tuberculosis, severe.

RABBITS.

220	0·1 mg.	Died 30 days	G.T., acute.
221	1·0 mg.	„ 21 „	G.T.



COW-CALF 589.
Subcut.
Dose : 50 mg.
Died : January 31, 1905.
40 days.
P.M.—General tuberculosis, severe.

TABLE 32B.

VIRUS H 32. "Y.W."
BRONCHIAL GLANDS.

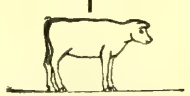
CULTURE INOCULATION.

June 28th, 1905.

Culture derived from human bronchial glands, through Rabbit 166.
Strain first obtained on 6th January, 1905, and had, therefore, been 6 months in cultivation.
The 6th subculture was used for injection, 21 days old, on pure bovine serum.



BULL-CALF 837.
Subcut.
Dose : 50 mg.
Died, 31st July, 1905 (33 days).
P.M.—General tuberculosis severe.



BULL-CALF 849.
Subcut.
Dose : 50 mg.
Died, 21st July, 1905 (23 days).
P.M.—General tuberculosis severe.

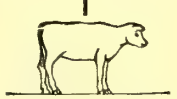
RABBITS.
Intraperit.

497*	10 mg.	Died, 32 days	G.T.
498	1 mg.	„ 12 „	Early T.
499	1 mg.	„ 15 „	G.T.
500	0·1 mg.	„ 27 „	G.T.

GUINEA-PIGS.
Intraperit.

1590*	1 mg.	Died, 18 days	G.T.
1591	1 mg.	„ 16 „	G.T.
1592	0·1 mg.	„ 16 „	G.T. and septic peritonitis.
1593	0·1 mg.	„ 15 „	G.T.

* Injection partly intracecal.



BULL-CALF 851.
Subcut.
Dose : 10 mg.
Died, 14th August, 1905 (47 days).
P.M.—General tuberculosis severe.



BULL-CALF 855.
Subcut.
Dose : 10 mg.
Died, 1st August, 1905 (34 days.)
P.M.—General tuberculosis moderate.

VIRUS H 32. "Y.W."

Y.W., a Male Child, aged Two Years and Nine Months; admitted to Hospital on September 12th, 1904, suffering from Pulmonary Tuberculosis. Died on September 30th, 1904.

Family History.—There was no history of tubercle.

Clinical History.—The child had been wasting for about six months before admission. The abdomen had been always somewhat swollen. During the last two months there had been some cough. The child's appetite was good. There had been no diarrhoea: the stools were offensive. During the last three weeks swelling of the hands and feet had been noticed, and the child appeared to be drowsy.

On admission he was thin and anæmic. There was some cyanosis of the lips: the tonsils were large, and there was some œdema of the legs. The lungs on examination showed obvious signs of extensive disease: the abdomen was much swollen, the umbilicus everted, and there was slight dulness on palpation in both flanks. The liver was much enlarged, but the spleen could not be detected.

The child gradually got worse, and died eighteen days after admission.

POST-MORTEM EXAMINATION.

Cranium.—Meninges of brain healthy,

Abdomen.

Peritoneum.—There were a few miliary tubercles on the surface.

Intestines.—Showed extensive ulceration.

Liver.—Showed a few tubercles on the surface.

Spleen.—Studded with tubercles. There was a small caseating mass in the centre of the organ.

Kidneys.—Normal.

Mesenteric Glands.—Enlarged and caseating.

Thorax.

Lung.—Studded with miliary tubercles.

Bronchial Glands.—Not enlarged, but contained a few miliary tubercles.

DESCRIPTION OF MATERIAL RECEIVED AT BLYTHWOOD FARM.

The lungs, mesenteric glands and bronchial glands were sent to Blythwood, each being enclosed in a separate wrapper, and kept entirely distinct. The material arrived frozen solid.

A portion of one of the Lungs, about 4 cubic inches in extent, was dark red in colour, and mottled with greyish coloured irregularly-shaped tubercles, which had more or less coalesced into a sort of network. Most of these tubercles showed up light on the darker lung substance, and some were slightly yellowish in colour.

Bronchial Glands.—Alongside the trachea, and above its bifurcation, were a number of swollen dark red lymphatic glands, the larger being about the size of a pea. In some of these cream-coloured tubercles could be seen.

Mesentery.—The mesentery presented a lobulated mass of glands, measuring roughly $3\frac{1}{2}$ in. by $2\frac{1}{2}$ in., and about 1 in. in the thickest part. When dissected out these glands were of considerable size, some of the larger ones exceeding the size of a big cherry. They were in an advanced stage of caseation. When dissected from the mesentery, the glands used for making the emulsion weighed 50 grammes.

Emulsions were made from all three sources. All were rich in tubercle bacilli, particularly the lung emulsion. The bacilli in the bronchial gland emulsion were long and large, square-ended, parallel-sided, and showed no beading. These characters were not so marked in either the lung or mesenteric gland emulsions. The bacilli in the emulsion made from the mesenteric glands appeared to be shorter than those in the emulsion made from the lung.

BULL-CALF 533. (Virus H 32. "Y.W.")

Subcutaneous—Inoculation of emulsion of human lung

Dose—654,160,000 tubercle bacilli. [Vol.: 13 cc. E=50,320,000 tubercle bacilli per cc.]

Date—October 1st, 1904.

Weight at Inoculation—1 cwt. 0 qrs. 25 lbs. (Age about 13 weeks.)

Killed—When dying, November 5th, 1904. 35 days after inoculation.

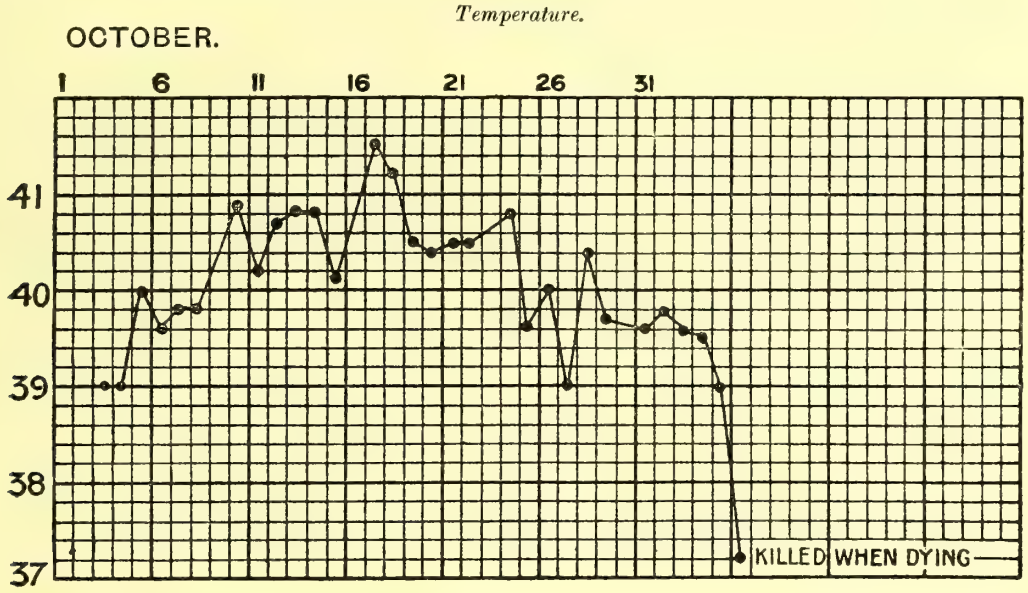
Clinical Notes.

The calf was inoculated on October 1st, 1904. Ten days later there was a flat hot swelling at the seat of inoculation, measuring 5½ in. by 2¾ in. The right prescapular gland was enlarged, 3½ in. long.

Both local swelling and gland rapidly increased in size. On October 25th, 24 days after inoculation, the former measured 9 in. by 5 in., and the latter was 6½ in. in length.

On November 5th, 35 days after inoculation, the calf was killed when in a dying condition. It had been ill for the previous fortnight or more, standing with head down, back arched, and roughened coat. Respiratory trouble, however, was not marked until a few days before death.

Temperature.



Weights.

The calf lost weight steadily during the experiment, the total loss being one-seventh of its original weight.

	cwts.	qrs.	lbs.	
October 1st, 1904 -	1	0	25	Inoculated.
October 11th, 1904 -	1	0	23	
October 25th, 1904 -	1	0	11	
November 5th, 1904 -	1	0	6	Killed when dying.

Total loss of weight during experiment.—19 lbs.

Average rate of loss per week.—3·8 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Thin.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a large and prominent tumour, which measured 7 in. by 4½ in. by 3 in., and weighed 1 lb. 8 ozs. In its centre was a deep and ragged crack, surrounded by an area which was obviously occupied by a slough. There was a small quantity of foul smelling discharge.

Section showed the tumour to be of the infiltrating variety, composed deeply of muscle and superficially of skin, and packed with small tubercles. The central part was occupied by a large yellow necrotic mass, which contained a ragged and extensive cavity, communicating with the crack mentioned above. There was a good deal of œdema below the tumour, and the infiltration of the muscles extended beyond the limits as above described towards the dewlap.

Right Prescapular Gland.—Was much enlarged. It was closely incorporated with the surrounding tissue, from which it was with difficulty freed. (This has been common in similar cases, though it has not as a rule been described.) It measured 4 in. by 2 in. by 2 in., and weighed 4 ozs. The cortex was composed chiefly of salmon pink caseo-necrotic tissue, and partly of a sort of network of yellowish white caseous tissue.

Left Prescapular Gland.—Was slightly enlarged and contained numerous tubercles.

Right Prepectoral Gland.—Was enlarged and caseous throughout.

Pectoral Glands.—The right pectoral glands were much enlarged, one being as large as a pigeon's egg. The larger contained a network of caseating tissue, the smaller one or two tubercles only.

Cervical Glands.—One right deep cervical gland was as large as a bantam's egg, and similar to the larger pectoral gland described above.

Right Axillary Gland.—Was much enlarged, over 1¼ in. long. It contained one early caseous tubercle only.

Left Axillary Gland.—Was slightly enlarged, and contained numerous tubercles.

Thorax :

Pleura (Costal and diaphragmatic.)—Normal.

Lungs.—About the anterior half of each small lobe, together with the anterior corner of the left posterior lobe, was purple pink in colour and completely consolidated. These solid portions were very sharply defined from the rest of the lung. They were studded with small tubercles, whitish grey and prominent, often collected together into little groups. In the rest of the organ were similar tubercles, which however, were less conspicuous, owing to the absence of colour contrast. Most of them were situated in the centre of little irregular translucent grey areas. Section showed consolidated lobules throughout, the whole lung being packed with small tubercles with yellowish white centres.

Thoracic Glands.—Were enlarged. Together they weighed about 2½ ozs.; the large posterior thoracic measured 3¾ in. by 1¼ in. by ¾ in. They were composed of translucent pearly grey tissue, infiltrated with yellowish white points (confluent tubercles).

Pericardium, Heart.—Normal.

Abdomen:

Peritoneum, Omentum.—On the omentum were about eight or nine tubercles, the largest as big as a good-sized shot. There were also numerous little elevations which looked like tubercles, but which were seen to be little villous tufts when examined under water.

Intestines.—Normal.

Mesenteric Glands.—Were small; the normal state of glands not functionally active. In almost every gland were several grey tubercles of the size of shot, and one or more nodules of a larger size infiltrated with yellow points. In the glands corresponding to the anterior end of the intestine the tubercles were much more numerous, some of the nodules being as large as small peas, but obviously quite early. Clusters of little tubercles occurred not infrequently.

Spleen.—Was full of shot-sized tubercles, larger than those in the liver, opaque yellowish white, with grey translucent margins.

Liver.—The liver was spotted with a considerable number of tubercles, some of which were on the surface, and had thin overhanging margins. These were of a pearly grey colour, and the larger about an eighth of an inch in diameter. The rest, of various sizes, some of them quite minute, were situated more deeply. Section showed them scattered throughout the organ.

Hepatic Glands.—Were enlarged, and on section similar to the thoracic.

Kidneys.—There were a few small tubercles in each kidney.

Suprarenals.—Normal

Renal Glands, Lumbar Glands.—Slightly enlarged; packed with tubercles.

Iliac Glands.—Contained a good many early caseous tubercles.

Genito-Urinary System:

Testes.—Normal.

Special Glands:

Precrural, Pubic, Gluteal, Ischiatic, Popliteal.—Contained a good many early caseous tubercles.

Submaxillary, Parotideal, Pharyngeal, Hyoid.—All contained numerous small tubercles with caseous centres.

Tongue, Palate, Tonsils, Pharynx.—Normal.

Eyes.—There was a central opacity in each lens, which existed prior to inoculation, but no sign of tubercle in the eye.

COW-CALF 537. (Virus H 32. "Y.W.")

Subcutaneous—Inoculation of emulsion of human lung.

Dose—654,160,000 tubercle bacilli. [Vol.: 13 cc. E=50,320,000 tubercle bacilli per cc.]

Date—October 1st, 1904.

Weight at Inoculation—1 cwt. 2 qrs. 7 lbs. (Age about 17 weeks.)

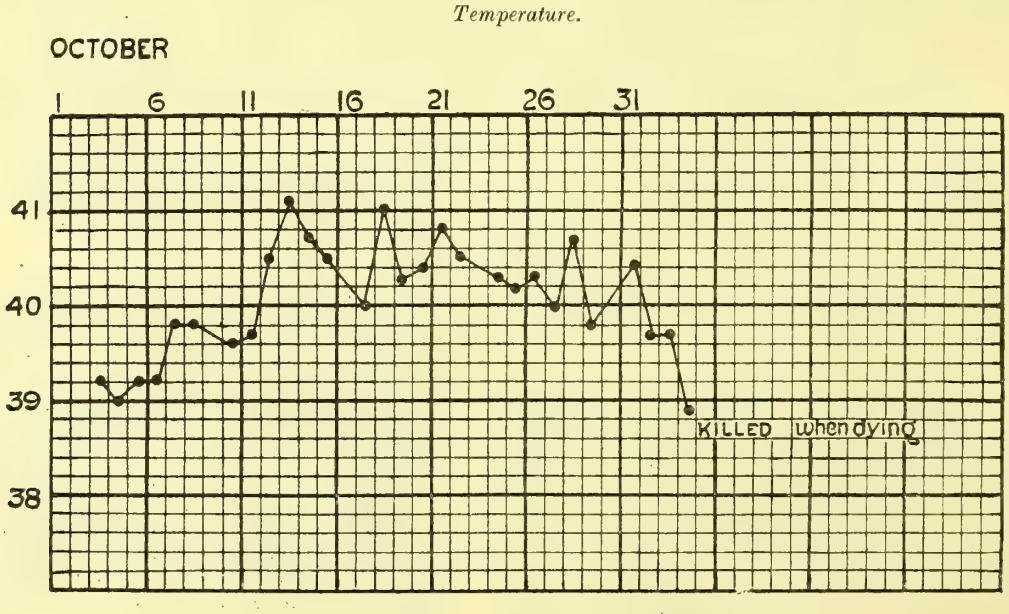
Killed—When dying, November 3rd, 1904. 33 days after inoculation.

Clinical Notes.

The calf was inoculated on October 1st, 1904. Ten days later there was a flat and hot swelling at the seat of inoculation measuring 5 in. by 3½ in. The right prescapular gland was 2¾ in. long. On October 25th, 24 days after inoculation, the swelling measured 7½ in. by 5½ in., and the gland was 6 in. long.

The calf became very thin; up to October 28th it had appeared fairly well, but on this day its respiration was accelerated, with forcible expiration, and the calf looked ill. After this it grew rapidly worse. On November 2nd it was obviously nearing its end. On November 3rd its temperature was falling, and it was killed when almost in a dying state (33 days after inoculation).

Temperature.



Weights.

The calf lost one-sixth of its original weight during the experiment.

	cwts.	qrs.	lbs.	
October 1st, 1904 - -	1	2	7	Inoculated.
October 11th, 1904 - -	1	2	18	
October 25th, 1904 - -	1	1	25	
November 3rd, 1904 - -	1	1	5	Killed when dying.

Total loss of weight during experiment.—1 qr. 2 lbs.

Average rate of loss per week.—6·4 lbs.

Tuberculin Tests.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Very thin.

Local Lesion.—The tumour at the seat of inoculation, on the right side of the neck, was of the infiltrating variety, and was surrounded by a good deal of œdema, especially below. It measured 6 in. by 4 in. by 2½ in., and weighed 1 lb. 2 ozs.

On section the skin and subjacent muscles were thickly infiltrated with small caseous tubercles, and between them was the usual caseo-necrotic salmon pink mass. Beyond the limits of the tumour, as defined above, the muscles were infiltrated with small tubercles.

Right Prescapular Gland.—Was much enlarged. It weighed 6 ozs., and measured 4½ in. by 2½ in. by 2 in. On section it was firm, the cortex being composed partly of tough salmon pink necrotic tissue and partly of confluent grey tubercles with minute yellow centres. The medulla was studded with discrete tubercles.

Left Prescapular Gland.—Was considerably enlarged, and contained tubercles.

Right Prepectoral Gland.—Was the size of a marble, and similar on section to the right prescapular.

Right Pectoral Gland.—Was enlarged and contained tubercles.

Left Pectoral Gland, Left Axillary Gland.—Contained tubercles.

Cervical Glands.—The right deep cervical glands were enlarged and full of early tubercles.

The hæmo-lymph glands in the neighbourhood of the right pectoral and left prescapular glands contained tubercles.

Thorax :

Pleura.—Normal.

Lungs.—The lungs were voluminous and heavy, and weighed 7 lbs. The anterior lobes, and the thinner portions of the posterior lobes, were dark pink in colour and solid (sank in water), showing here and there only little air-containing patches. These portions were everywhere thickly studded with little whitish grey tubercles, which appeared on the surface as minute elevations. In the thicker posterior portions of the lungs, which still contained air, the tubercles were less conspicuous and more translucent, and on the surface they appeared as dark grey irregular translucent spots with a minute central opacity. The bronchi were full of frothy mucus.

Thoracic Glands.—All the thoracic glands were considerably enlarged, the large posterior mediastinal gland measuring 5 in. by 1¾ in. Their cortices were entirely composed of confluent grey tubercles with yellowish white centres. The connective tissue which surrounded the mediastinal glands was œdematous.

Pericardium, Heart.—Normal.

Abdomen :

Peritoneum, Omentum.—Normal.

Intestines.—Under the mucous membrane of the small intestine were found rather numerous tubercles. They were of the size of a small shot, very hard, grey and translucent. They could be made to shell out, and then looked like little pearls.

Mesenteric Glands.—A few minute tubercles, rather difficult to see, were found in almost every gland.

Spleen.—Was not enlarged. It contained very numerous small tubercles.

Liver.—Was extremely thickly peppered with very minute tubercles, both on the surface and on section.

Hepatic Glands.—Were enlarged, and on section similar to the thoracic.

Kidneys.—Fairly numerous tubercles were seen on the surface of the right kidney, fewer on that of the left. A few tubercles were seen in the substance of each.

Suprarenals.—Normal.

Renal Glands, Lumbar Glands, Iliac Glands.—All contained tubercles in the cortex.

Genito-Urinary System :

Uterus, Mammary Gland.—Normal.

Special Glands :

Precrural, Pubic, Gluteal, Ischiatic, Popliteal.—All contained tubercles in the cortex.

Submaxillary, Hyoid, Parotideal, Pharyngeal.—All contained tubercles.

The pharyngeal glands were enlarged and œdematous.

Tongue, Palate, Tonsils, Pharynx.—Normal.

Microscopical Examination.

Nodule from Intestine.—Tubercle bacilli.

Scraping from the Mucous Membrane of Intestine at a distance from a Nodule.—No tubercle bacilli.

BULL-CALF 487. (Virus H 32. "Y.W.")

Subcutaneous—Inoculation of emulsion of human mesenteric glands.

Dose—2,348,400,000 tubercle bacilli. [Vol.: 40 cc. E=58,710,000 tubercle bacilli per cc.]

Date—October 1st, 1904.

Weight at Inoculation—1 cwt. 1 qr. 25 lbs. [Age, about 17 weeks.]

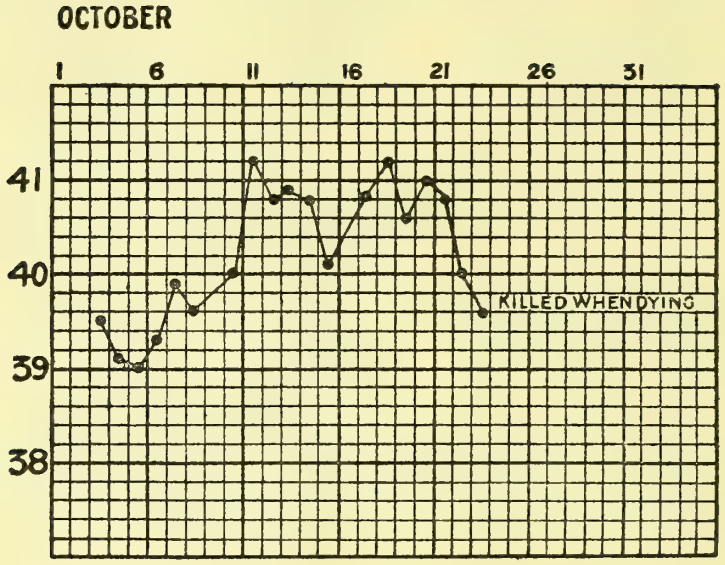
Killed—When dying, October 23rd, 1904. 22 days after inoculation.

Clinical Notes.

The calf was inoculated on October 1st, 1904. Ten days later there was a hot, flat swelling at the seat of inoculation measuring 6 by 4 in. The right prescapular gland was 3½ in. long.

On October 20th, 19 days after inoculation, the respiration was first noticed to be embarrassed. Two days later it was much worse; and on October 23rd, 22 days after inoculation, the calf was killed when in a dying condition.

Temperature.



Weights.

The calf lost more than one-sixth of its original weight during the experiment.

		cwts.	qrs.	lbs.	
October 1st, 1904	-	1	1	25	Inoculated.
October 11th, 1904	-	1	1	21	
October 23rd, 1904	-	1	0	24	Killed when dying.

Total loss of weight during experiment.—1 qr. 1 lb.
Average rate of loss per week.—9·2 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Extremely thin.

Local Lesion.—The tumour at the seat of inoculation on the right side of the neck weighed 1 lb. 12 ozs., and measured 7 in. by 5 in. by 3 in. It was of the infiltrating variety, the central part consisting of a mott'ed pink and yellow slough, which contained numerous small cavities, and one large one, as big as a walnut. This latter was full of very offensive fluid. The superficial part of the tumour consisted of infiltrated skin and the deeper of infiltrated muscle. There was a considerable quantity of œdema around. Considerably beyond the limits of the tumour as defined above, the superficial muscles were infiltrated with tubercles, and this could be traced as far as the dewlap. Embedded in the infiltrated mass were the prepectoral glands, the larger of which was an inch in longest diameter. These were caseous throughout.

Right Prescapular Gland.—Measured 4 in. by 2½ in. by 1¾ in., and weighed 5 ozs. On section it was tough, salmon pink in colour, and caseo-necrotic throughout.

Left Prescapular Gland.—Contained numerous small grey tubercles.

Pectoral Glands.—Were slightly enlarged, and contained caseous nodules.

Axillary Glands.—Contained numerous small grey tubercles.

Thorax :

Pleura.—Normal.

Lungs.—The lungs were extremely heavy, and weighed 5 lbs. 11 ozs. The greater part of them were consolidated, and dark pink in colour. Here and there little lobules containing air stood out as pale spots. Only the rounded dorsal portions, and part of the lateral margin, retained any appreciable quantity of air, and even this portion was congested and very œdematous. Everywhere the lung was peppered as thickly as possible with minute grey tubercles. These were of course seen more readily in the darker portions, but were not more numerous there. The degree of consolidation varied ; some parts actually sank in water, while others barely floated.

Thoracic Glands.—Were enlarged, and together weighed 4 ozs. On section the cortex of each was greyish and opaque, and presented here and there little foci of commencing caseation. The connective tissue of the mediastinum was œdematous.

Heart.—Normal.

Abdomen :

Peritoneum, Omentum, Intestines.—Normal.

Mesenteric Glands.—Were rather large for an animal not actively digesting (it took little or no food the day before death). Here and there minute grey tubercles were just visible.

Liver.—The liver was peppered all over with minute grey tubercles about the same size as those in the lung. Section showed them scattered equally thickly throughout the substance of the organ.

Hepatic Glands.—Were swollen, and on section resembled the thoracic glands, but were in a less advanced stage. There was some œdema of the connective tissue around.

Kidneys.—The kidneys were rather large, and contained many tubercles similar to, but less numerous than those in the liver.

Suprarenals.—Were apparently normal.

Spleen.—Was not enlarged, and was apparently normal, but the structure of this organ would make it difficult to see tubercles of the size of those in the liver and kidneys.

Renal Glands, Lumbar Glands, Iliac Glands.—Contained numerous small grey tubercles.

Genito-Urinary System :

Testes.—Normal.

Special Glands :

Precrural, Pubic, Popliteal.—Contained numerous small grey tubercles.

A hæmo-lymph gland close to the left popliteal was enlarged and full of tubercles.

Submaxillary, Pharyngeal, Hyoid.—Contained numerous small grey tubercles.

Parotideal.—Doubtful.

Tongue, Palate, Tonsils, Pharynx.—Normal.

Eyes.—There were some very minute tubercles in the choroid.

Brain.—Normal.

Microscopical Examination.

Post-Thoracic Gland.—Tubercle bacilli.
Iliac Gland.—Tubercle bacilli.
Hepatic Gland.—Tubercle bacilli.
Mesenteric Gland.—Tubercle bacilli.
Scraping from Suprarenal.—No tubercle bacilli.
Scraping from Spleen.—Tubercle bacilli, seven seen.
Rib Marrow.—No tubercle bacilli.

BULL-CALF 465. (Virus H 32. "Y.W.")

Subcutaneous—Inoculation of emulsion of human mesenteric glands.

Dose—1,174,200,000 tubercle bacilli. [Vol.: 20 cc. E=58,710,000 tubercle bacilli per cc.]

Date—October 1st, 1904

Weight at Inoculation—1 cwt. 1 qr. 16 lbs. [Age, about 16 weeks.]

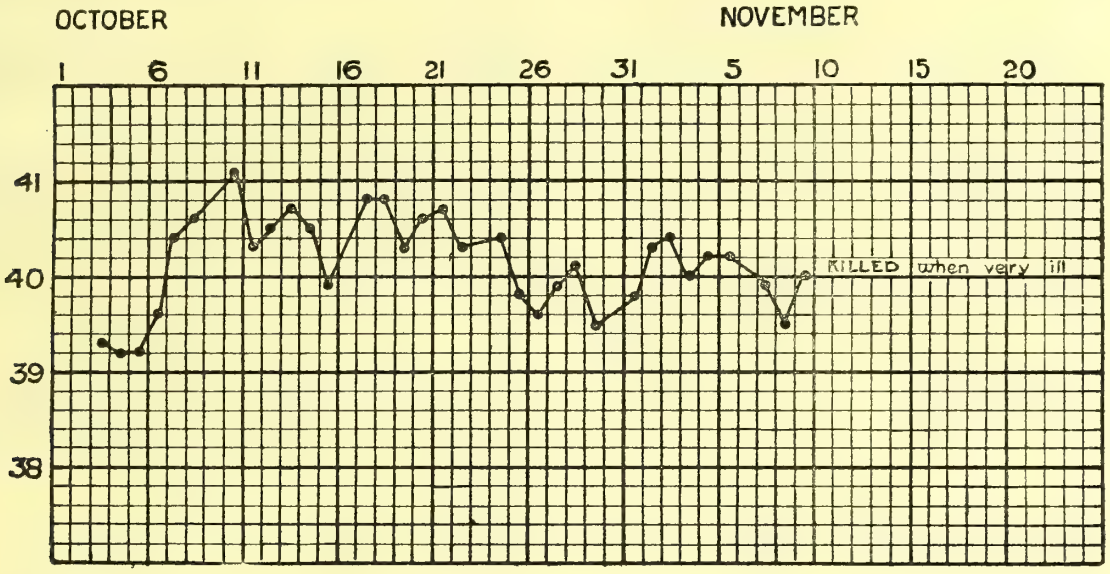
Killed—When very ill, November 9th, 1904. 39 days after inoculation.

Clinical Notes.

The calf was inoculated on October 1st, 1904. Ten days later there was a hot flat swelling at the seat of inoculation, measuring 5½ by 3 in. The right prescapular gland was 3 in. long. There was some œdema in dewlap. The swelling and the gland rapidly increased in size; on October 25th the former measured 8 in. by 6 in., and the latter was between 5 in. and 6 in. long.

On November 9th, 1904, 39 days after inoculation, the calf was killed when very ill. It had become extremely thin, eating but little, and increased frequency of respiration had been observed for nearly three weeks previous to death.

Temperature.



Weights.

During the first 24 days the calf gained 4 lbs.; after this it lost weight very rapidly (27 lbs. in 14 days).

	cwts.	qrs.	lbs.	
October 1st, 1904 -	1	1	16	Inoculated.
October 11th, 1904 -	1	1	19	
October 25th, 1904 -	1	1	20	
November 8th, 1904 -	1	0	21	Killed the following day when very ill.

Total loss of weight during experiment.—23 lbs.

Average rate of loss per week.—4·2 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Very thin.

Local Lesion.—The tumour at the seat of inoculation, on the right side of the neck, measured 6½ in. by 4 in. by 2½ in., and weighed 1 lb. 4 ozs. There was a considerable amount of œdema below it, which extended into the dewlap. The tumour on section was seen to infiltrate the skin and subjacent muscle. It was composed principally of a caseo-necrotic dense salmon-pink tissue, which contained one or two small ragged cavities, or rather fissures, filled with thin fluid.

Right Prescapular Gland.—Was much enlarged. It measured 4 in. by 2¼ in. by 2 in., and weighed 5 ozs. It was rather closely incorporated with the surrounding tissue and was composed almost entirely of dense salmon-pink caseo-necrotic tissue.

Left Prescapular Gland.—Contained several tubercles.

Right Prepectoral Gland.—Was as big as a small cherry, and caseo-necrotic throughout.

Pectoral Glands.—The right pectoral glands were much enlarged, and composed of grey translucent tissue, with a moss-like caseous infiltration.

Axillary Glands.—The right axillary gland was considerably enlarged, and contained several yellow tubercles. The left contained several tubercles.

Cervical Glands.—The right deep cervical glands were enlarged and contained caseating nodules like those in the pectoral.

Thorax:

Pleura.—There was a slight development of tubercle along the margins of some of the ribs. On the pleural surface of the diaphragm there was a slight hypertrophy of villous tufts; in a few of these small solid tubercles could be detected.

Lungs.—Were voluminous and heavy, and weighed nearly 7 lbs. The entire surface was closely beset with grey tubercles about the size of pins' heads, the centres of which were opaque. About the anterior half of each lung was dark pink in colour, œdematous and consolidated (sank in water). Section showed numerous tubercles scattered throughout the organ.

Thoracic Glands.—Were very much enlarged, and together weighed nearly 8 ozs. The large posterior thoracic measured 6½ in. by 2 in. by 1 in. These glands were composed of an irregular network of caseating points and patches, embedded in grey translucent fibrous tissue.

Heart.—Three tubercles, of about the size of pins' heads, were found in the wall of the right auricle, just extending to the endocardium, but not projecting into it. One was also found in the right ventricle.

Abdomen:

Peritoneum, Omentum.—Several small lenticular tubercles were found loosely attached to the omentum.

There were also one or two tubercles on the peritoneal surface of the diaphragm, following the lines running between the white fibres.

Intestines.—About twenty small tubercles were found in the small intestine. These were most numerous in the anterior part, absent in the middle, and reappeared in the lower ileum. They were situated under the mucous membrane, and could be seen through the peritoneum as little yellowish opaque spots. They were a little larger than mustard seeds, had a shotty feel, and on section showed caseous centres.

Large intestine normal.

Mesenteric Glands.—Numerous small tubercles were seen in every gland. These appeared either as small round tubercles with yellow centres, or else as nodules up to a quarter of an inch in diameter, composed of firm translucent grey tissue infiltrated with yellow points. These tubercles could not be made to shell out.

Spleen.—The spleen contained numerous small tubercles about the size of large pins' heads, with irregular translucent margins and opaque centres.

Liver.—Fairly numerous little whitish tubercles were seen on the surface of the liver. A few of the larger ones, of the size of a large pin's head, were quite superficial, and had slightly overhanging margins. Section showed small tubercles fairly numerous throughout the organ.

Hepatic Glands.—Were enlarged and tuberculous, and resembled on section the thoracic glands.

Kidneys.—Small tubercles were fairly numerous in each kidney, rather more so in the left. Many of these were quite small rounded tubercles, while some of the larger ones seen on the surface were found to penetrate as wedges into the cortex.

Suprarenals.—One or two small tubercles were seen in each suprarenal.

Renal Glands, Lumbar Glands, Iliac Glands, Sciatic Glands.—All contained several tubercles.

Genito-Urinary System :

Testes.—Not examined.

Special Glands :

Precrural, Pubic, Gluteal, Popliteal.—All contained several tubercles.

Ischiatic.—Very small. Normal.

Submaxillary.—The submaxillary glands on the right side contained numerous small tubercles. Those on the left contained fewer tubercles.

Parotideal, Pharyngeal.—On both sides contained numerous small tubercles.

Hyoid.—Contained fewer tubercles.

Tongue.—On the left side of the tongue, below the region of the circumvallate papillæ, was a minute ulcer with hard edges. Tubercle bacilli were found in its margins.

Palate.—On the pharyngeal surface of the palate were found two small yellow tubercles, one close to the right tonsil. There were two tubercles on the nasal surface of the palate.

Tonsils.—Normal.

Pharynx.—There were several tubercles on the thickened corrugated nasal membrane which descends into the naso-pharynx.

Eyes.—Two tubercles were seen in the choroid of one of the eyeballs.

Microscopical Examination.

Tubercle from Palate.—Rich in tubercle bacilli.

Ulcer on Tongue.—Tubercle bacilli.

Tubercle from Right Auricle of Heart.—Tubercle bacilli.

Tubercle from Small Intestine.—Tubercle bacilli numerous.

GOAT 7. (Female.) (Virus H 32. "Y.W.")

Subcutaneous—Inoculation of Emulsion of prescapular gland from Calf 487.

Dose—155,150,000 tubercle bacilli. [Vol. : 5 cc. E=31,030,000 tubercle bacilli per cc.]

Date—October 23rd, 1904.

Weight at Inoculation—3 qrs. 24 lbs.

Killed when very ill: November 19th, 1904. 27 days after inoculation.

Clinical Notes.

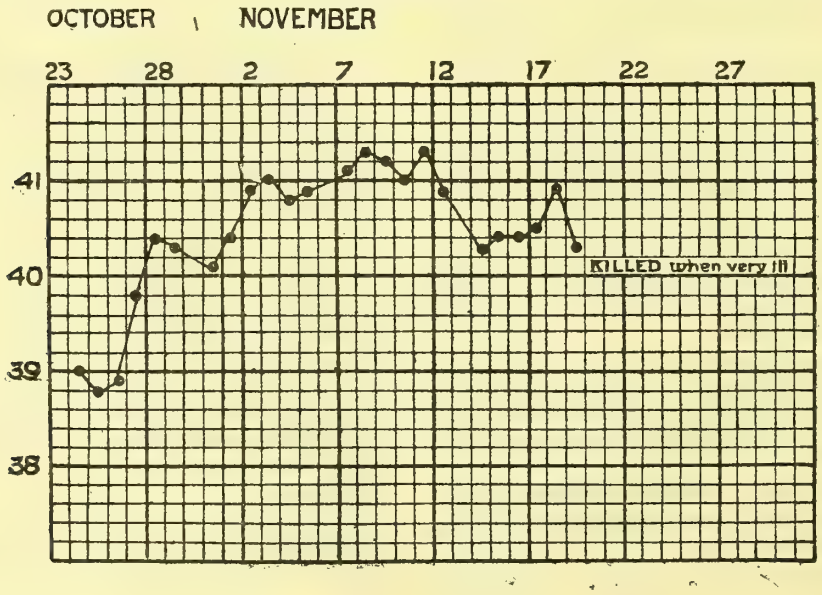
The goat was inoculated on October 23rd, 1904. Ten days later it was noticed to be unwell, and shivering. The temperature was very high (41·0° C.]

On November 16th, 24 days after inoculation, the animal had a fit, or rather a succession of fits. It began in the left fore leg, which was continually jerked up and down; next the head was bent sharply to the left and retracted. This was followed by violent tremors, culminating in general convulsions. These latter were repeated twice: on one occasion the animal was lying on its belly with all four legs stretched out straight.

After this no more fits occurred, but the animal appeared very ill and weak, being scarcely able to stand. When lying down it preferred to rest its head against the manger. It was breathing rapidly, with some difficulty, and had a good deal of cough.

On November 19th, 27 days after inoculation, it was worse, and in considerable distress, continually groaning with each respiration. It was therefore killed.

Temperature.



Weights.

The goat lost over one-seventh of its original weight during the experiment.

	qrs.	lbs.	
October 24th, 1904 - -	3	24	Inoculated.
November 8th, 1904 - -	3	19	
November 19th, 1904 - -	3	8	Killed when dying.

Total loss of weight during experiment.—16 lbs.

Average rate of loss per week.—4 lbs.

POST-MORTEM EXAMINATION.

General Condition.—Poor.

Local Lesion.—The tumour at the seat of inoculation, on the right side of the neck, measured 5½ in. by 3 in. by 1 in. It involved the skin, a portion of which, about 1 in. in diameter, was black and necrotic. Section showed a caseating network, which infiltrated the skin and subjacent muscle, and formed a solid layer of yellow tissue between the two.

Right Prescapular Gland.—Measured 3 in. by 1⅝ in. by ⅞ in. It was firm, and composed of translucent grey tissue, thickly peppered with opaque points.

Left Prescapular Gland.—Slightly enlarged. Contained numerous tubercles, and was more solid than usual.

Right Prepectoral Gland.—Contained a few tubercles.

Axillary Glands.—Normal.

Thorax :

Pleura.—Normal.

Lungs.—The lungs were heavy. They were rather closely packed with dark red tubercles, with very small opaque whitish centres. The individual tubercles did not exceed an eighth of an inch in diameter. In many places they were separate, but in other parts little groups were more or less confluent. Section showed them thickly scattered throughout the lung substance. The lung was not particularly congested, and there was no œdematous consolidation, such as one frequently sees in calves with acute tuberculosis.

Thoracic Glands.—Were slightly enlarged, but soft. They contained numerous minute irregular opaque tubercles, sometimes arranged in little nodules, scattered throughout their substance.

Heart.—Normal.

Abdomen :

Peritoneum, Omentum.—Normal.

Intestines.—Three minute tubercles were seen in the mucous membrane of the small intestine.

The large intestine was normal.

Mesenteric Glands.—One tubercle only was seen.

Spleen.—In the spleen fairly numerous minute whitish tubercles could be seen.

Liver. The liver showed faintly on the surface numerous minute pale foci. These were for the most part invisible on section, but some of the larger ones could be detected. They were obviously very early tubercules.

Hepatic Glands.—Showed a few small tubercles.

Kidneys.—Numerous minute opaque points could be seen on the surface of each kidney, like those on the liver, only more visible. Only a few could be seen on section.

Suprarenals.—Normal.

Renal Glands.—Contained one or more small tubercles.

Lumbar Glands.—Two were normal; one contained a tubercle.

Genito-Urinary System.

Uterus.—No sign of tubercle could be seen.

Mammary Gland.—There were some rather hard translucent bodies in the mamma, which resembled tubercles, but when crushed between ground glass plates no opaque centres could be seen in them. (Tubercle bacilli found.)

Supramammary Glands.—Contained several tubercles.

Special Glands :

Precrural, Gluteal.—Contained one or more small tubercles.

Popliteal.—Normal.

Submaxillary, Left Hyoid, Right Pharyngeal.—Each contained one or more small tubercles.

Left Pharyngeal, Right Hyoid.—Normal.

In the lymphatic glands the tubercles were quite small, but appeared on section as very prominent points. They shelled out very readily, and then looked very like little seed pearls.

Tongue, Palate, Tonsils, Pharynx.—Normal.

Eyes, Brain.—Normal.

Thyroid.—One tubercle was seen in the thyroid, on the left side.

Microscopical Examination.

Prescapular Gland.—Tubercle bacilli.

Kidney.—Tubercle bacilli.

Mammary Gland.—Tubercle bacilli.

Tubercle from Small Intestine.—One tubercle bacillus seen.

BULL-CALF 587. (Virus H 32. "Y.W.")

Subcutaneous—Inoculation of culture derived from human mesenteric glands, direct.

Dose—50 milligrammes.

Date—December 22nd, 1904.

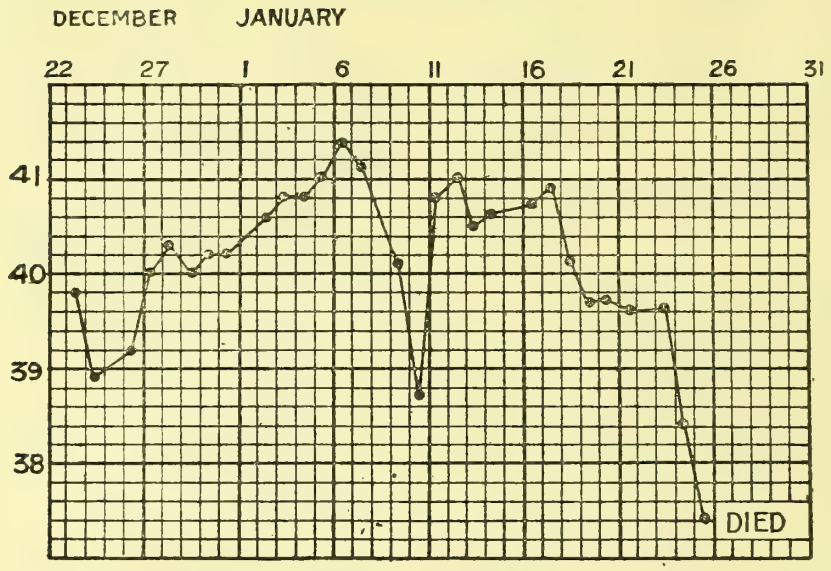
Weight—1 cwt. 0 qrs. 14 lbs. [Age, about 12 weeks.]

Died—January 26th, 1905. 35 days after inoculation.

Clinical Notes.

The calf was inoculated on December 22nd, 1904. It gradually became ill; on January 20th the respiration was first noticed to be increased. On January 22nd the calf was very ill, and on January 26th, 35 days after inoculation, it died.

Temperature.



Weights.

The calf lost nearly a quarter of its original weight during the experiment.

	cwts.	qrs.	lbs.	
December 22nd, 1904 -	1	0	14	Inoculated.
January 3rd, 1905 -	1	0	0	
January 26th, 1905 -	0	3	13	Died.

Total loss of weight during experiment.—1 qr. 1 lb.

Average rate of loss per week.—5·8 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION

General Condition.—Thin.

In the neck, extending into the dewlap, and posteriorly as far as the anterior margin of the thorax, was a considerable amount of yellow gelatinous œdema.

Local Lesion.—The tumour at the seat of inoculation, on the right side of the neck, was firmly adherent, both to skin and subjacent muscle. When freed as much as possible from both it weighed 1 lb. 4 ozs., and measured 7½ in. by 4½ in. by 2½ in. On the superficial surface there was a large ulcer, which measured 2 in. by 2½ in. On section the tissue was of a pale green colour, and was seen to be composed superficially of much thickened skin, beneath which was a layer of yellowish pale green caseous material about an inch thick. In this layer, in its anterior part, was a large ragged cavity traversed by ragged trabeculæ which contained some pale green pus. Beneath this again lay a mass of muscle infiltrated with small caseous points, the line of demarcation between the caseous material and the muscle being ill-defined.

Right Prescapular Gland.—Measured 4 in. by 2 in. by 1½ in., and weighed 4 ozs. It was easily freed from the surrounding tissue, but a few small deposits of caseous tuberculous material were seen on the surface of the capsule.

On section it was of a pale pink colour, with slender striæ of a darker colour. The cortex consisted of dense caseous material, while the central portion was made up of small caseous tubercles very closely set together, leaving no healthy gland tissue, and becoming more dense as the cortex was approached. The capsule was considerably thickened.

Left Prescapular Gland—Measured 2½ in. by 1¼ in. by ⅜ in. It was very œdematous, purple in colour, and studded with small cream-coloured projecting tubercles.

Right Prepectoral Glands.—The larger measured 2 in. by 1 in. by ¾ in. On section it was seen to be very congested, of a dark red colour, with a few caseous tubercles in the cortex at one end of the gland, while at the other end the normal tissue was replaced by caseous material.

The smaller prepectoral on the right side was the size of a pea, and caseous throughout.

Left Prepectoral Glands.—A left prepectoral gland was very œdematous, and on section similar to the prescapular. The smaller prepectoral gland was the size of a small pea, very œdematous, and on section purple in colour, with several small cream-coloured tubercles.

Pectoral Glands.—A pectoral gland contained many large caseous tubercles.

Axillary Gland.—Both contained a few caseous tubercles.

Cervical Glands.—The deep cervical glands were very œdematous, and contained a few caseous tubercles.

A hæmo-lymph gland under the great pectoral muscle contained several caseous nodules.

Thorax :

Diaphragm.—A number of caseous tubercles were seen on the pleural surface of the diaphragm.

Lungs.—Were heavy, and weighed 3 lbs. 12 ozs. The posterior lobes collapsed moderately, and floated in water, though in the left lung there were many pneumonic patches. The anterior lobes, especially those on the right, were pneumonic. The surfaces of both lungs were thickly beset with grey translucent tubercles, each of which had a yellow centre. On section of the right lung there were many areas of lobular congestion, and tubercles were very numerous. On section of the left lung the congestion and œdema were more marked, and grey tubercles with yellow centres occurred in very large numbers.

Trachea.—Several tubercles occurred in the upper seven inches of the trachea.

Thoracic Glands.—The left bronchial gland was of a purple colour, and very œdematous. It was considerably infiltrated with much caseous tuberculous deposit.

The posterior mediastinal gland was large and œdematous, and contained many caseous tubercles.

The peribronchial glands contained a number of small tubercles.

Pericardium.—There were many tubercles on the surface of the pericardium, the size of pins' heads, firm and projecting.

Heart.—There was considerable œdema in the neighbourhood of the right auriculo-ventricular groove. Three tubercles were seen on the heart; one on the surface of the left ventricle, one in the right auriculo-ventricular groove, and one at the base of the left ventricle. On section the right ventricle was a little dilated.

Abdomen :

Peritoneum, Omentum.—On opening the abdomen the great omentum was found to be the seat of numerous large tubercles; the peritoneum which covered the small intestine was also the seat of a number of grey translucent tubercles.

A few caseous tubercles were seen on the peritoneal surface of the diaphragm.

Intestine.—Throughout the whole length of the small intestine tubercles occurred in large numbers, being most numerous towards the lower end. No ulceration was seen in the Peyer's patches, but they were all congested.

A few whitish caseous spots were found in the large intestine.

Mesentery.—A few grey translucent tubercles were found in the mesentery.

Mesenteric Glands.—All contained many large yellow caseous tubercles.

Spleen.—Was large, and on section was seen to be a mass of large firm caseous tubercles.

Liver.—The surface of the liver was peppered with a large number of grey translucent tubercles with large white centres. On section tubercles were also seen to be exceedingly numerous, large and white.

Hepatic Glands.—Were large and œdematous. and each contained a large number of yellowish caseous tubercles.

Kidneys.—Were congested. A few tubercles were seen on the surface and on section.

Suprarenals.—Both contained many small caseous tubercles.

Renal Glands, Lumbar Glands, Iliac Glands, —Contained many large caseous tubercles.

Genito-Urinary System :

Testes.—Normal.

Special Glands :

Precrural, Gluteal, Popliteal.—Contained many large caseous tubercles.

Ischiatic.—Contained several caseous tubercles.

Submaxillary, Parotideal.—Contained many large caseous tubercles.

Pharyngeal.—Were enlarged, œdematous, and contained many caseous tubercles.

Hyoid.—Contained a few caseous tubercles.

Tongue, Palate.—Normal.

Tonsils.—A number of tubercles were found in the tonsils.

Naso-Pharynx.—The mucous membrane lining the naso-pharynx contained a number of large caseous projecting tubercles.

Larynx.—Several tubercles occurred in the mucous membrane lining the larynx.

Eyes.—Apparently natural.

Microscopical Examination.

Tubercle from Heart.—Tubercle bacilli numerous.

Tubercle from Small Intestine.—Tubercle bacilli numerous.

Tubercle from Large Intestine.—Tubercle bacilli numerous.

COW-CALF 589. (Virus H 32. "Y.W.")

Subcutaneous—Inoculation of culture derived from human mesenteric glands, direct.

Dose—50 milligrammes.

Date—December 22nd, 1904.

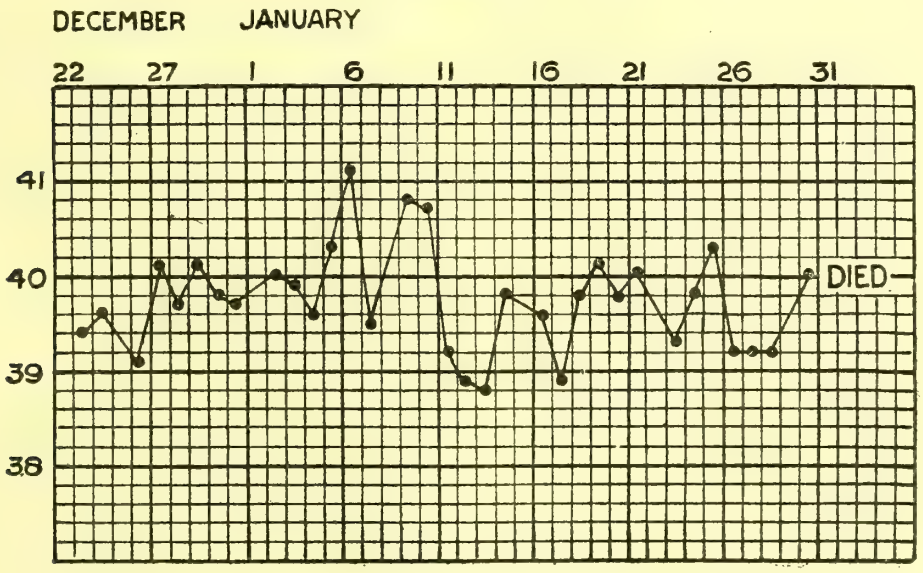
Weight at Inoculation—1 cwt. 0 qrs. 10 lbs. [Age about 11 weeks.]

Died—January 31st, 1905. [40 days after inoculation.]

Clinical Notes.

The calf was inoculated on December 22nd, 1904. On January 21st, a month after inoculation, the animal was first noticed to be seriously ill. It had been losing weight for some time before this, and the temperature had been high. During the week following it rapidly grew worse, and died on January 31st, 40 days after inoculation.

Temperature.



Weights.

The calf lost nearly one-fifth of its original weight during the experiment.

	cwts	qrs.	lbs.	
December 22nd, 1904 - -	1	0	10	Inoculated.
January 3rd, 1905 - -	1	0	0	
January 17th, 1905 - -	0	3	24	
January 31st, 1905 - -	0	3	15	Died

Total loss of weight during experiment.—23 lbs.

Average rate of loss per week.—4 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Thin.

Local Lesion.—The tumour at the seat of inoculation on the right side of the neck was firmly adherent to skin and subjacent muscle, both of which were infiltrated by it. It measured 8 in. by 3½ in. by 1½ in., and with the infiltrated skin and muscle weighed 9 ozs.

On section it was of a creamy pink colour, and composed on the surface of a thickened layer of skin, infiltrated with caseous matter. Beneath this was a layer of creamy caseous material about an inch deep, and subjacent to this again the muscle, infiltrated with small caseous tubercles.

Right Prescapular Gland.—Measured 3 in. by 1½ in. by 1¼ in., and weighed 1¼ ozs. On section it was seen to be made up of a thickened glistening capsule, and of a firm pale pink caseous substance. A little of the gland tissue remained in the centre, where a narrow strip was seen to be infiltrated with small caseous tubercles.

Left Prescapular Gland.—Was very congested and œdematous, and was infiltrated, especially in the cortex, with small caseous points.

Prepectoral Glands.—The right circular prepectoral gland was about ⅝ths of an inch in diameter, and caseous throughout. The reniform gland had a caseous area in the centre, and a number of small caseous tubercles scattered throughout the remainder of the substance.

Axillary Glands.—The right contained small tubercles mainly in the cortical portion of the gland. The left was enlarged and œdematous, with a few caseous points in the cortex.

Cervical Glands.—The deep cervical glands were much congested, and contained discrete yellow tubercles.

Thorax :

Pleura.—On the pleural surface of the diaphragm a number of small caseous tuberculous deposits were seen, especially in the neighbourhood of the fold of pleura enclosing the third lobe of the lung. Each of these tubercles was surrounded by an area of congestion.

Lungs.—The lungs were heavy; they weighed 4 lbs. 11 ozs., and barely floated in water. The apical portion of the right lung was pneumonic, and in the basal lobe there were many irregular shaped areas of lobular congestion. The left lung was also pneumonic in one of the apical lobes; the remainder of the lung was much congested and œdematous. Innumerable small grey tubercles with yellow centres were scattered thickly over the surfaces of both lungs. On section similar tubercles were found to be equally numerous, and could be felt projecting from the cut surface.

Trachea.—On opening the trachea small pinpoint tubercles, surrounded by areas of congestion, were seen along its whole length.

Thoracic Glands.—The left bronchial gland was enlarged and œdematous. On section the cortical portion was seen to be creamy white and caseous, dark pink in the centre, where the normal gland tissue was infiltrated with small caseous points.

Large numbers of caseous tubercles were scattered throughout the substance of the posterior mediastinal gland. These tubercles were often confluent, forming small caseous areas.

The glands in the arch of the aorta were deeply congested, and contained some yellow caseous tubercles.

The peribronchial glands were caseous in the cortical portion, the centres dark, œdematous, and infiltrated with small caseous points.

A small gland in the thorax, on the cartilage of the first rib, contained small caseous tubercles scattered throughout.

Pericardium.—On the parietal layer of the pericardium a few small cream-coloured points were found, attached by a pedicle to the pericardium. On the visceral layer of the pericardium there was a small patch of pericarditis, about an inch in diameter, at the origin of the great vessels. In this patch were seen a number of small tubercles, each surrounded by an area of congestion.

Heart.—In the wall of the left auricle one tubercle was seen; otherwise the heart appeared normal.

Abdomen :

Peritoneum, Omentum.—On the surface of the omentum, especially in the folds between the second and third stomachs, were found a number of firm projecting tubercles, each surrounded by an area of congestion.

The glands in the lesser omentum were enlarged, and in all cases the seat of tuberculous deposits.

The abdominal surface of the diaphragm was normal.

Stomach.—From the peritoneal surface of the third stomach small circular points the size of pins' heads could be seen shining through the wall. They were situated in the mucous membrane, and projected from its surface. They were firm to the touch, and on section had yellow softened centres.

Intestines.—Throughout the whole length of the small intestine were small caseous tuberculous deposits, these being in exceedingly large numbers. There was some congestion in the neighbourhood of the Peyer's patches, but no ulceration could be seen.

The large intestine also contained large numbers of caseous tubercles.

Mesenteric Glands.—Were very large and œdematous, and every gland was the seat of many caseous points.

Spleen.—The spleen contained a large number of small caseous tubercles.

Liver.—The surface of the liver was thickly sprinkled with small grey tubercles with yellow centres. On section similar tubercles were seen in very large numbers.

Hepatic Glands.—Not examined.

Kidneys.—On the surface of each kidney a few tubercles were seen, and on section one or two were seen in the cortical portion.

Suprarenals.—One or two tubercles (?) were seen in each.

Renal Glands, Lumbar Glands, Iliac Glands.—Were all the seat of well marked yellow caseous deposits.

Special Glands :

Precrural.—Were the seat of well marked yellow caseous deposits.

Gluteal.—Were large and congested, and contained caseous tuberculous deposits.

Ischiatic.—The left contained small caseous tubercles. The right was less affected.

Popliteal.—Resembled the precrural.

Submaxillary, Parotideal.—Were very large and deeply congested, and contained many yellow caseous tuberculous foci.

Pharyngeal.—Were very large, deeply congested, and contained large numbers of yellow caseous tuberculous foci.

Hyoid.—Were also enlarged and deeply congested, but contained fewer tuberculous deposits.

Tongue, Palate.—Normal.

Tonsils.—Contained a number of yellow caseous points.

Larynx.—There were some yellow pinpoint tubercles on the cartilage of the larynx.

Eyes.—Were apparently normal.

Microscopical Examination.

Tubercle from Stomach. — Tubercle bacilli in large numbers.

Tubercle from Cæcum.—Tubercle bacilli numerous.

Caseous Focus from Tonsil.—Tubercle bacilli in large numbers.

Tubercle from Small Intestine.—Tubercle bacilli numerous.

Tubercle from Large Intestine.—Tubercle bacilli numerous.

Parietal Pericardium.—Tubercle bacilli.

Tubercle from Left Auricle.—Tubercle bacilli, very few.

Left Suprarenal.—Tubercle bacilli. Two seen.

Right Suprarenal.—Tubercle bacilli. Two seen.

CALF 837. (Virus H 32. "Y.W.")

Subcutaneous—Inoculation of culture derived from human bronchial glands, through Rabbit 166.

Dose—50 milligrammes.

Date—June 28th, 1905.

Weight at Inoculation—3 qrs. 8 lbs. (Age about 5 weeks.)

Died—July 31st, 1905. 33 days after inoculation.

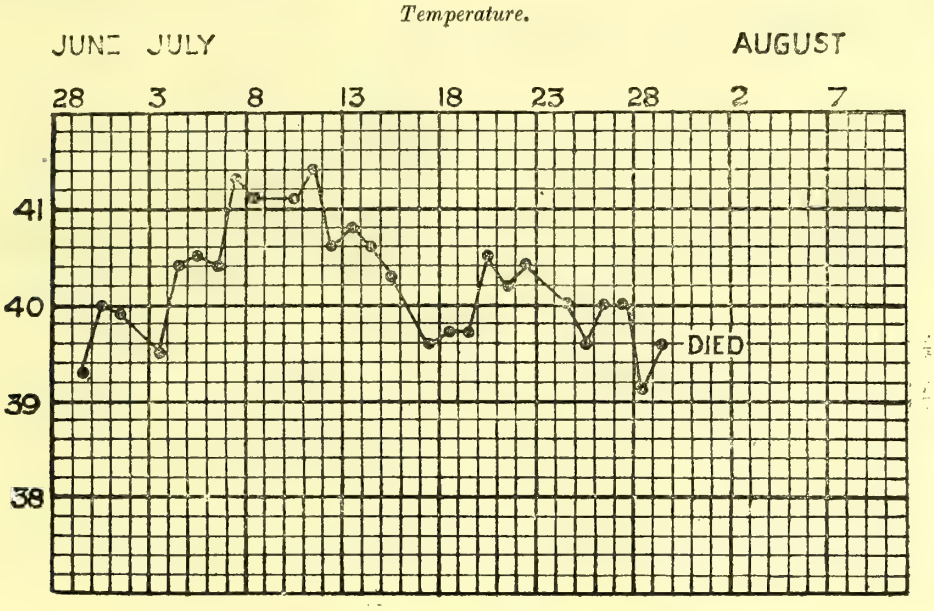
Clinical Notes.

The calf was inoculated on 28th June, 1905.

The progress of the disease was similar to that usually seen in calves injected with 50 milligrammes of culture of a virulent virus.

The calf died on July 31st, 33 days after inoculation.

Temperature.



Weights.

The loss of weight was not so great as is usually seen in similar cases.

	cwt.	qrs.	lbs.	
June 28th, 1905 -	0	3	8	Inoculated.
July 31st, 1905 -	0	2	24	Died.

Total loss of weight during experiment.—12 lbs.

Average rate of loss per week.—2·5 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

Local Lesion.—The tumour at the seat of inoculation, on the right side of the neck, was flat and solid, measuring 5½ in. by 3½ in. by 2 in., and weighing 10 ozs. It was dense, caseo-necrotic, and extensively infiltrated skin and subjacent muscle.

Right Prescapular Gland.—Was much enlarged, 3½ in. by 2 in. by 1⅓ in., and weighed 5 ozs. It was salmon pink and caseo-necrotic throughout.

Right Prepectoral Gland.—As large as a small cherry; was similar in structure.

Axillary Glands.—Contained rather numerous small grey tubercles, very uniformly distributed.

Thorax :

Pleura.—Showed hypertrophied fringes along the margins of many of the ribs on the right side, and of a few on the left. They covered little tubercles at the bases. There was little change on the pleural surface of the diaphragm.

Lungs.—Were deeply congested, the anterior and inferior halves being dark red and airless. Numerous little tubercles were scattered rather thickly over the surface. On the darker portions they appeared as whitish grey points, slightly raised. Elsewhere they were whitish, with a dark translucent margin. Section showed them scattered thickly and uniformly throughout the lungs.

Trachea.—Many small whitish tubercles, surrounded by a zone of congestion, were seen in the trachea.

Thoracic Glands.—Were moderately enlarged. The cortex was firm, mottled grey and opaque.

Heart.—A few very minute translucent grey tubercles were seen in the termination of the vena cava superior, and one in the right auricle.

Abdomen :

Peritoneum, Omentum.—A considerable number of lenticular tubercles, one-eighth or one-fifth of an inch in diameter, were loosely attached to the omentum.

Œsophagus.—Many small whitish tubercles were seen in the anterior half of the œsophagus. The rest was normal.

Stomach.—Small whitish tubercles were numerous in that part of the stomach where the mucous membrane is like a rough towel, and they were present also where it resembles a honeycomb; but there were no tubercles in the true stomach, or in the spherical part with parallel laminated valves. From the peritoneal surface many pale spots could be seen through the wall of the stomach. On examining the mucous surface these were found to correspond to raised pimples, each with a central fovea. They were whitish in colour, and averaged about an eighth of an inch in diameter. When the mucous membrane was stripped from them, the little nipple-like prominence still remained. On section they showed no central focus.

Intestines.—The mucous membrane of the small intestine showed many little opaque tubercles. In the ileum they were very numerous; elsewhere they were scattered sparsely, mainly in the Peyer's patches.

In the large intestine an occasional small tubercle was seen.

Mesenteric Glands.—Were not enlarged. They contained scattered discrete tubercles.

Spleen.—Contained rather a large number of little tubercles, visible on the surface. Somewhat fewer appeared on section.

Liver.—Had a considerable number of grey tubercles on the surface. They were slightly raised, and did not exceed a sixteenth of an inch in diameter.

Portal Glands.—Were scarcely enlarged. They did not show a general tuberculous change, but contained discrete tubercles.

Suprarenals.—Normal.

Renal Glands.—Contained rather numerous small grey tubercles, of the size of shot, uniformly distributed.

Lumbar Glands, Iliac Glands.—Contained rather numerous small grey tubercles, very uniformly distributed.

Genito-Urinary System:

Testes.—Normal.

Special Glands:

Precrural, Pubic, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Post-Pharyngeal, Hyoid.—Contained rather numerous small grey tubercles, very uniformly distributed.

Tongue.—One or two little tubercles (an eighth of an inch) were seen on each side of the root of the tongue, slightly raised, and with abraded surfaces.

Tonsils.—There were several tubercles in each tonsil.

Pharynx.—There were some tubercles on the corrugated mucous membrane of the naso-pharynx, and a few on the pharyngeal surface of the palate.

Larynx.—On the tip of the right arytenoid was a little raised and slightly abraded tubercle.

Thyroid.—Normal.

Eyes.—Normal.

Microscopical Examination.

Scraping from Tubercle on Right Arytenoid.—Tubercle bacilli.

Tubercles from Oesophagus (very little material).—Tubercle bacilli (two seen).

Scraping from Tubercle on Side of Tongue.—Tubercle bacilli.

Spleen.—Tubercle bacilli numerous.

Tubercle from Stomach.—Tubercle bacilli.

Tubercle from Vena Cava Superior (too little material).—No tubercle bacilli seen.

CALF 849. (Virus H 32. "Y.W.")

Subcutaneous—Inoculation of culture derived from human bronchial glands, through Rabbit 166.

Dose—50 milligrammes.

Date—June 28th, 1905.

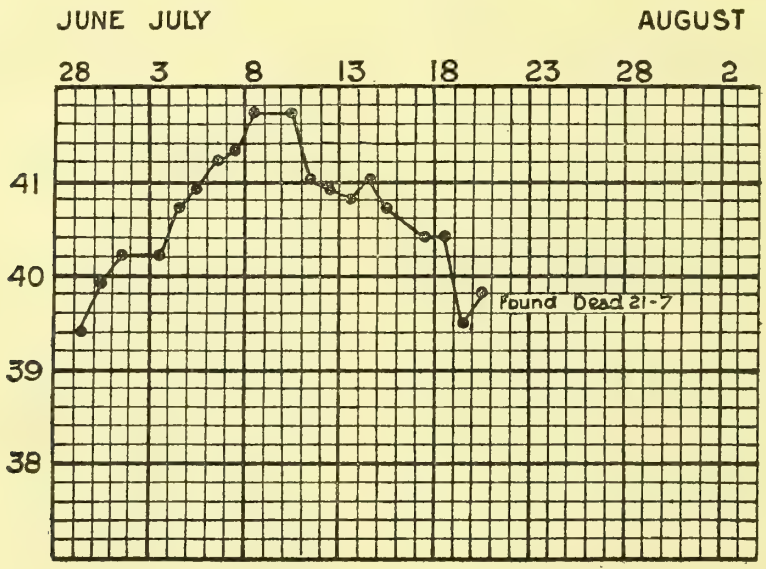
Weight at Inoculation—3 qrs. 16 lbs. (Age about 7 weeks.)

Died—July 21st, 1905. 23 days after inoculation.

Clinical Notes.

The calf was inoculated on June 28th, 1905. The progress of the disease was similar to that usually seen in calves injected with 50 mg. of a virulent virus. The calf died on July 21st, 23 days after inoculation.

Temperature.



Weights.

The calf lost one-fifth of its original weight during the experiment.

	qrs.	lbs.	
June 28th, 1905 - - -	3	16	Inoculated.
July 21st, 1905 - - -	2	24	Died.

Total loss of weight during experiment.—20 lbs.

Average rate of loss per week.—6 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Very thin.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a flat tumour, which measured 5½ in. by 1½ in. by 3 in., and was firm and caseo-necrotic. One could just see that the skin and subjacent muscle was being infiltrated.

Right Prescapular Gland.—Was much enlarged, and measured 3½ in. by 1½ in. by 1¾ in. It was firm, and consisted principally of confluent caseating foci buried in translucent grey tissue. At the ends of the gland the foci had coalesced, forming salmon-pink, caseo-necrotic areas.

Left Prescapular Gland.—Contained many little grey tubercles.

Prepectoral Glands.—Two prepectoral glands were seen on the right side, lying side by side. One was spherical, as large as a cherry, and caseo-necrotic throughout. The other, which was soft and deeply congested, was peppered with small grey tubercles.

Axillary Glands.—Contained many little grey tubercles.

Thorax :

Pleura.—A few tubercles were visible on the costal pleura.

Lungs.—Were voluminous and heavy, and weighed 4 lbs. 6 ozs. They were deeply congested, and anterior parts especially being dark red in colour, and even purple in places. The darker parts were completely consolidated. The lungs everywhere contained numerous minute grey tubercles. On the surface these appeared as minute grey elevations, which were just visible on the paler portions, and were more easily seen on the darker.

Trachea.—Contained numerous small tubercles.

Thoracic Glands.—Were considerably enlarged. The medulla was deeply congested, the cortex firm, grey, mottled with irregular opaque spots.

Heart.—There were three small tubercles in the right auricle, close to the entrance of the superior vena cava. There was also a minute tubercle on one of the flaps of the tricuspid valve. Five small tubercles, very prominent and easily removed, were seen in the left auricle.

Abdomen :

Peritoneum, Omentum.—The omentum was studded with fairly numerous little yellow tubercles, surrounded by loose congested tissue, which caused them to appear as irregular red spots.

Intestines.—Throughout both small and large intestine numerous small grey tubercles could be seen.

Mesenteric Glands.—Were normal in size. Many little grey tubercles were seen in them.

Spleen.—Was firm and granular, like the hard roe of a fish, but there were no visible tubercles in it.

Liver.—The surface was thickly peppered with very small grey tubercles. The same were clearly seen throughout its substance.

Kidneys.—On the surface of each kidney a few very minute tubercles could just be seen. They appeared rather numerous on section.

Suprarenals.—Were apparently normal.

Renal Glands, Lumbar Glands, Iliac Glands.—All contained many little grey tubercles.

Genito-Urinary System :

Testes.—Normal.

Special Glands :

Precrural. Pubic, Gluteal, Ischiatic, Popliteal.—All contained many little grey tubercles.

Submaxillary, Parotideal, Pharyngeal, Hyoid.—All contained many small grey tubercles.

Tongue.—Normal.

Tonsils.—No definite tubercles could be seen in the tonsils.

Pharynx.—There were a number of small tubercles on the pharyngeal surface of the palate, as well as on the corrugated septum of the nose.

Larynx.—Contained numerous small tubercles.

Thyroid.—Was a great deal larger than usual.

Eyes.—Normal.

Microscopical Examination.

Tubercle from Small Intestine.—Tubercle bacilli few.

Scraping from Spleen.—Tubercle bacilli.

Tubercle from Left side of Heart.—Tubercle bacilli.

CALF 851. (Virus H 32. "Y.W.")

Subcutaneous—Inoculation of culture derived from human bronchial glands through Rabbit 166.

Dose—10 milligrammes.

Date—June 28th, 1905.

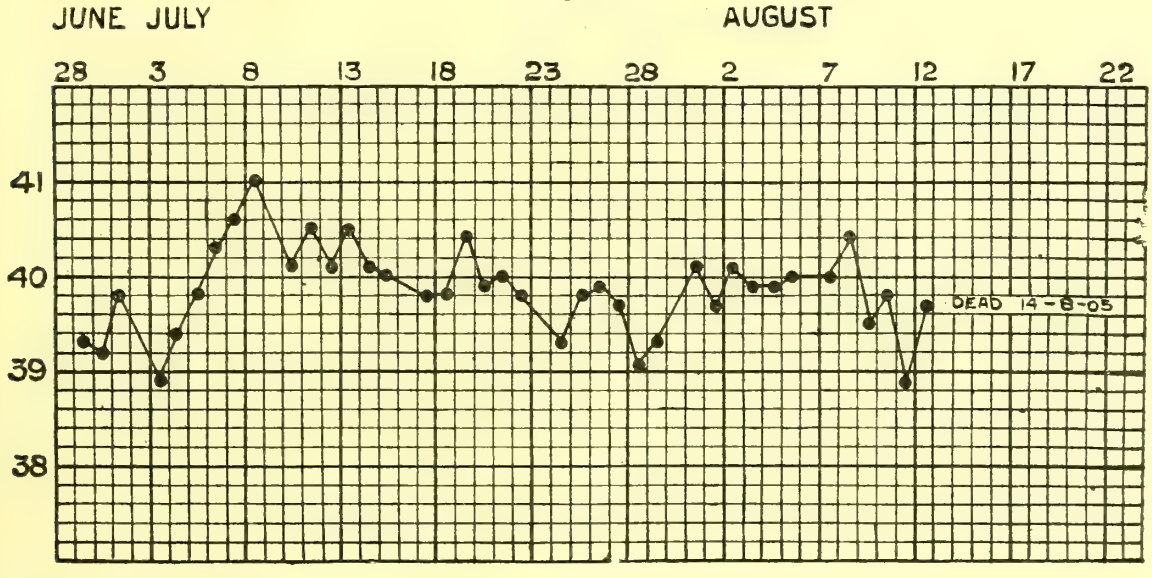
Weight at Inoculation—1 cwt. Age about 10 weeks.

Died—August 14th, 1905. 47 days after inoculation.

Clinical Notes.

The calf was inoculated on June 28th, 1905. It grew very thin, and began to breathe with difficulty about five weeks after injection; after this it got steadily worse, and died on August 14th (47 days).

Temperature.



Weights.

The animal lost a little more than one-seventh of its original weight during the experiment.

	cwt.	qrs.	lbs.	
June 28th, 1905 - - -	1	0	0	Inoculated.
August 14th, 1905 - -	0	3	11	Died.

Total loss of weight during experiment.—17 lbs.

Average rate of loss per week.—2·5 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a flat solid tumour, which measured 5½ in. by 3½ in. by 2 in., and weighed 10 ozs. On section it was seen to be fibro-necrotic, and to infiltrate skin and subjacent muscle.

Right Prescapular Gland.—Was much enlarged. It measured 3½ in. by 1¾ in. by 1½ in., and weighed 4 ozs. It was caseo-necrotic throughout.

Left Prescapular Gland.—Contained caseating tubercles.

Right Prepectoral Gland.—Was unusually large, being one and an eighth inches in diameter, and almost spherical. It was similar in structure to the right prescapular.

Axillary Glands.—Contained several or many caseating tubercles.

Thorax :

Pleura.—The fringes along the borders of the ribs were hypertrophied and frequently overlaid little tubercles.

Lungs.—Were voluminous and heavy, and weighed six and a half pounds. More than half was of a deep red colour, and practically airless. They were studded rather thickly with caseating tubercles. Section showed them packed with irregular caseating tubercles, arranged more or less into groups, the constituent members of which were united together in a solid, soft, red and translucent tissue, which elsewhere surrounded individual tubercles. Frequently the confluence of caseating tubercles had occurred, causing the appearance of irregular caseating masses. There was but little air-containing tissue.

Trachea.—There was one small tubercle in the trachea.

Thoracic Glands.—Were much enlarged, and principally consisted of a caseating network, which contained little islands of firm translucent grey tissue.

Heart.—One tubercle (?) (a little pale speck) was seen in the right ventricle.

Abdomen :

Small Intestine.—Numerous caseating tubercles were widely scattered throughout.

Large Intestine.—Tubercles were less numerous than in the small intestine.

Mesenteric Glands.—Contained numerous tubercles and tuberculous nodules.

Spleen.—Was packed full of little tubercles.

Liver.—Was studded rather thickly with little round, pearly-grey tubercles, which did not exceed ⅛ in. in diameter. The intervening tissue showed numerous red specks, which indicated little tubercles seen through a small thickness of liver substance. Section showed numerous well-defined pearly-white tubercles thickly scattered throughout the organ.

Hepatic Glands.—Were very large. In structure they resembled the thoracic glands, but were less advanced.

Kidneys.—Showed a moderate number of very small tubercles, not very conspicuous, but amounting to several in every lobule. They were also seen on section but appeared less numerous.

Suprarenals.—Two small tubercles were seen in the left and one in the right.

Renal Glands.—Contained many caseating tubercles.

Coelic Glands.—Contained numerous tubercles and tuberculous nodules.

Lumbar Glands, Iliac Glands.—Contained several or many caseating tubercles.

Genito-Urinary System :

Testes.—One caseous tubercle of the size of a very small pea was seen in the left.

Special Glands :

Precrural, Pubic, Gluteal, Ischiatic, Popliteal.—Contained several or many caseating tubercles.

Submaxillary, Parotideal, Posterior Pharyngeal.—Contained numerous caseating tubercles.

Pharynx.—Contained a few tubercles in the corrugated mucous membrane which descends from the nasal septum.

Larynx.—There was one small tubercle in the larynx, and a tuberculous elevation, slightly abraded, on the summit of the left arytenoid.

BULL-CALF 855. (Virus H 32. "Y.W.")

Subcutaneous—Inoculation of culture derived from human bronchial glands, through Rabbit 166.

Dose—10 mi ligrammes.

Date—June 28th, 1905.

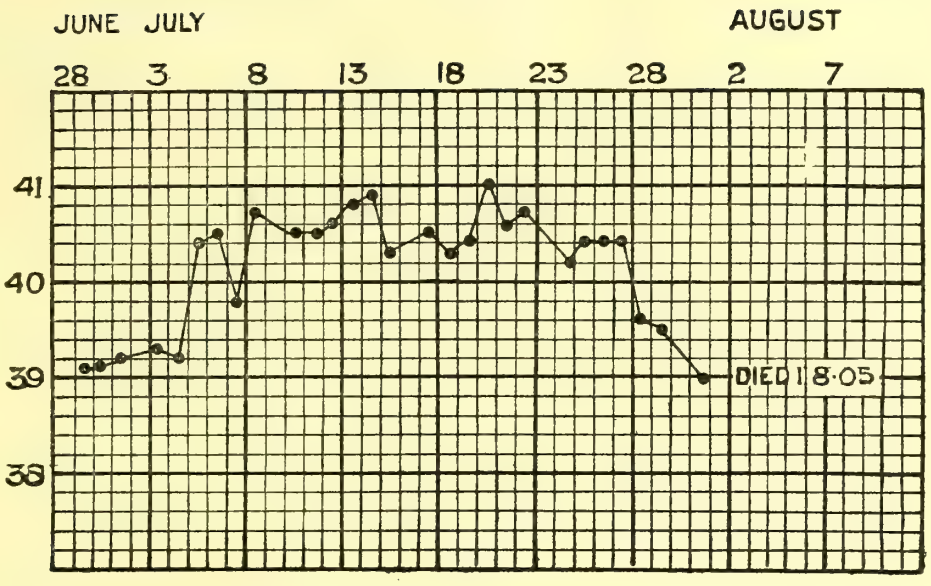
Weight at Inoculation—3 qrs. 19 lbs. (Age about 9 weeks.)

Died—August 1st, 1905. 34 days after inoculation.

Clinical Notes.

The calf was inoculated on June 28th, 1905.
The progress of the disease was similar to that usually seen in calves affected with acute tuberculosis.
The animal died on August 1st, 34 days after inoculation.

Temperature.



Weights.

The calf lost nearly one-fifth of its original weight during the experiment.

	qrs.	lbs.	
June 28th, 1905 - - -	3	19	Inoculated.
August 1st, 1905 - - -	3	0	Died.

Total loss of weight during experiment.—19 lbs.

Average rate of loss per week.—4 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Very thin.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a small tumour 4 in. by 3 in. by 1½ in., which weighed 4 ozs., with a central ulcer which contained a dry ragged slough. It was composed of caseo-necrotic tissue, and infiltrated the subjacent muscle.

Right Prescapular Gland.—Was enlarged, and measured 3½ in. by 2 in. by 1½ in. It weighed 3 ozs., and was caseo-necrotic throughout.

Left Prescapular Gland.—Contained a few grey tubercles.

Right Prepectoral Gland.—Was as large as a cherry, and similar in structure to the right prescapular.

Axillary Glands.—Contained each a few grey tubercles.

Thorax :

Pleura.—The pleura showed a trace of tubercle along the rib margins.

Lungs.—Were deeply congested. The anterior part, involving more than half of each lung, was dark red in colour and airless. Little grey tubercles were thickly scattered over the surface and throughout the substance of the organ. On section of the posterior lobes, many of the tubercles were seen to occur in groups, embedded in a portion of consolidated lung.

Trachea.—No tubercles were seen in the trachea.

Thoracic Glands.—Were considerably enlarged. The long posterior thoracic measured 4½ in. by 2 in. by ¾ in., and weighed 2 ozs. It was firm, grey and translucent, and infiltrated by a caseous network.

The other thoracic glands were similar.

Heart.—Was free from tubercles. The fat in the auriculo-ventricular groove had disappeared, and was replaced by œdema fluid.

Abdomen :

Peritoneum, Omentum.—Only a trace of tubercle was seen on the omentum.

Œsophagus.—Normal.

Intestines.—Two suspicious yellow foci were found in the upper part of the small intestine. The rest was normal.

Mesenteric Glands.—A few tubercles were seen here and there, but many of the glands had escaped.

Spleen.—Contained a relatively small number of little tubercles.

Liver.—Had a moderate number of little grey tubercles on the surface and in the substance. The latter especially were very minute.

Portal Glands.—Were slightly enlarged, rather firm, and contained groups of confluent tubercles.

Kidneys.—Contained many tubercles, several being seen on the surface of each lobule. They could also be seen in the cortex on section.

Suprarenals.—Normal.

Renal Glands, Lumbar Glands.—Were rather severely affected, and were packed with opaque tubercles, commencing to caseate.

Iliac Glands.—Contained each a few grey tubercles.

Genito-Urinary System :

Testes.—Normal.

Special Glands :

Precrural, Pubic, Gluteal, Right Ischiatic, Popliteal.—Contained each a few grey tubercles.

Left Ischiatic.—Normal.

Submaxillary, Parotideal, Posterior Pharyngeal, Right Hyoid.—Contained a few discrete grey tubercles not yet showing signs of caseation.

Left Hyoid (Two).—Normal.

Tongue, Palate.—Normal.

Tonsils.—One or more very small tubercles were seen in each tonsil.

Pharynx, Larynx.—Normal.

Eyes.—Normal.

Microscopical Examination.

Focus from Intestine.—Tubercle bacilli.

VIRUS H 33. "R.T."

AXILLARY GLANDS. (Operation.)

TABLE 33.

VIRUS H 33. "R.T."

AXILLARY GLANDS

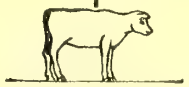
CULTURE INOCULATION.

December 21, 1904.

Strain derived from human axillary glands, direct.

Total duration of artificial cultivation : 4 months.

Sub-culture used for injection : 21 days old, on pure serum and glycerin-serum.



BULL-CALF 595.

Subcut.

Dose : 50 mg.

Killed, March 21, 1905 (90 days).

Fibrous walled tumour, with softened contents. Nearest glands caseo-necrotic. Very few minute tubercles in lungs and liver. (S.T.)

RABBITS

219	50·0 mg.	D. 69 days	G.T. not quite typical.
218	10·0 mg.	K. 90 „	Slight tuberculous peritonitis. Slight tuberculosis of lungs and kidneys.
217	1·0 mg.	K. 90 „	Very slight tuberculous peritonitis. Few tubercles in lungs.



BULL-CALF 603.

Subcut.

Dose : 50 mg.

Killed, March 21, 1905 (90 days).

Small fibrous and caseo-calcareous tumour. Nearest glands caseo-calcareous. (L.T.)

VIRUS H 33. "R.T."

R.T., Female Child Aged Seven, Admitted to Hospital on July 13th, 1904, Suffering from Tuberculous Glands of the Neck and Axilla. Operation on August 17th, 1904.

Family History.—There was a history of phthisis on the father's side.

Clinical History.—The patient had undergone an operation at another hospital one year before admission, when an abscess on the left side of the neck was incised.

The present condition consisted of an enlargement of the cervical glands on both sides of the neck, the swelling on the right side being limited to the posterior triangle, while on the left side, just below the angle of the jaw, there was an abscess due to a breaking down gland, and also other enlarged glands at a lower level. In the left axilla were also some enlarged lymphatic glands. The swelling in this situation had been noticed since shortly after the first operation. According to the mother's statement pediculi capitis had been observed for two years, and they were noticeable also on admission.

Two days after admission the abscess on the left side of the neck was incised, and a month later the axillary glands were removed by another operation. On September 10th, glands from the right side of the neck were incised, and were found to be breaking down.

The wounds at the various operations all suppurated, and were drained by tubes. They had, however, practically healed when the child was discharged on September 23rd.

From August 10th to August 16th, the child suffered from an abscess on the right cornea.

MATERIAL SENT TO BLYTHWOOD.

Axillary Glands.—Removed by operation on August 17th. About nine large glands, almost all the size of hazel nuts. The least affected contained one or more solid cream-coloured caseous foci, about $\frac{1}{8}$ in diameter. Similar but larger caseous patches were seen in other glands, while in several caseation was more advanced, and about half the gland had softened.

Microscopic Examination.

Emulsion of caseous material
1. One tubercle bacillus seen.
2. Two tubercle bacilli seen.

Caseo-purulent Focus.—No tubercle bacilli seen.

CALF 595. (Virus H 33. "R.T.")

Subcutaneous Inoculation of culture derived from human axillary glands.

Dose—50 milligrammes.

Date—December 21st, 1904.

Weight at Inoculation—1 cwt. 0 qrs. 18 lbs. (Age about 12 weeks.)

Killed—March 21st, 1905. [90 days after inoculation.]

Clinical Notes.

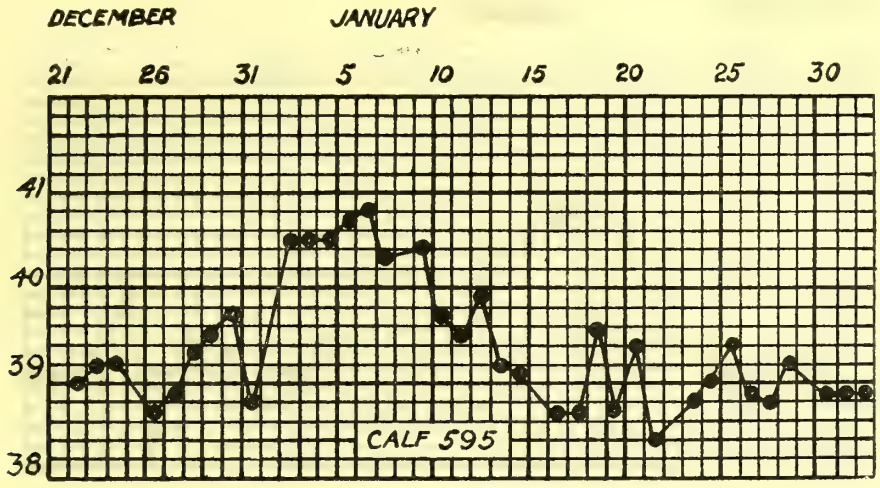
The calf was inoculated on December 21st, 1904.

A month later the swelling at the seat of inoculation measured 5 by 3 in. The right prescapular gland was enlarged, 4½ in. long.

Two months after inoculation the swelling measured 5½ in. by 3 in., forming a flat thickened layer extending into the dewlap. The gland measured 4½ in. by 3 in.

On March 21st, 1905, 90 days after inoculation, the calf was killed. With the exception of some slight constitutional disturbance at the commencement, the animal had remained well during the experiment.

Temperature.



After the end of January the temperature remained approximately normal.

Weights.

The calf gained weight slowly and irregularly.

	cwt.	qrs.	lbs.	
December 21st, 1904 - -	1	0	18	Inoculated.
January 3rd, 1905 - -	1	0	13	
January 17th, 1905 - -	1	0	14	
January 31st, 1905 - -	1	0	19	
February 14th, 1905 - -	1	0	26	
February 28th, 1905 - -	1	1	5	
March 14th, 1905 - -	1	1	13	
March 21st, 1905 - -	1	1	10	Killed.

Total gain of weight during experiment.—20 lbs.

Average rate of gain per week.—1·5 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—The tumour at the seat of inoculation, on the right side of the neck, measured 3½ in. by 2 in., by 1¼ in. It did not infiltrate the skin or subjacent muscle, and consisted of a fibrous wall, which contained portions of caseo-necrotic tissue and purulent débris.

Right Prescapular Gland.—Measured 2¾ in. by 1¼ in. by ¾ in. It consisted mainly of large caseo-necrotic masses, the edges of which were infiltrated with calcareous grains.

Left Prescapular Gland.—Normal.

Prepectoral Glands.—The right was the size of a large pea. It was similar to the right prescapular, and had a very thick white capsule. The left was normal.

Pectoral Glands, Axillary Glands.—Normal.

Thorax.

Pleura.—Normal.

Lungs.—Very close inspection revealed four or five very minute tubercles (?) scattered over the surface of the organ. These were dark grey and translucent, and in one or two an opaque centre could be seen. When picked out on the point of a knife some resembled minute grains of sand, and two, when crushed under the blade of a knife were found to be distinctly gritty.

Thoracic Glands, Heart.—Normal.

Abdomen.

Peritoneum, Omentum, Intestines, Mesenteric Glands, Spleen.—Normal.

Liver.—Two minute tubercles (?) were seen on the surface of the organ, and one was found in its interior.

Hepatic Glands, Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Gluteal, Submaxillary, Parotideal, Pharyngeal, Hyoid.—Normal.

Ischiatic.—One tubercle was found in the left. It was the size of a mustard seed, soft, and not calcareous. The right was normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

Microscopical Examination.

Tubercle from Ischiatic Gland.—Tubercle bacilli very scanty.

CALF 603. (Virus H 33. "R.T.")

Subcutaneous Inoculation of culture derived from human axillary glands.

Dose—50 milligrammes.

Date—December 21st, 1904.

Weight at Inoculation—1 cwt. 0 qrs. 27 lbs. (Age about 13 weeks.)

Killed—March 21st, 1905. [90 days after inoculation.]

Clinical Notes.

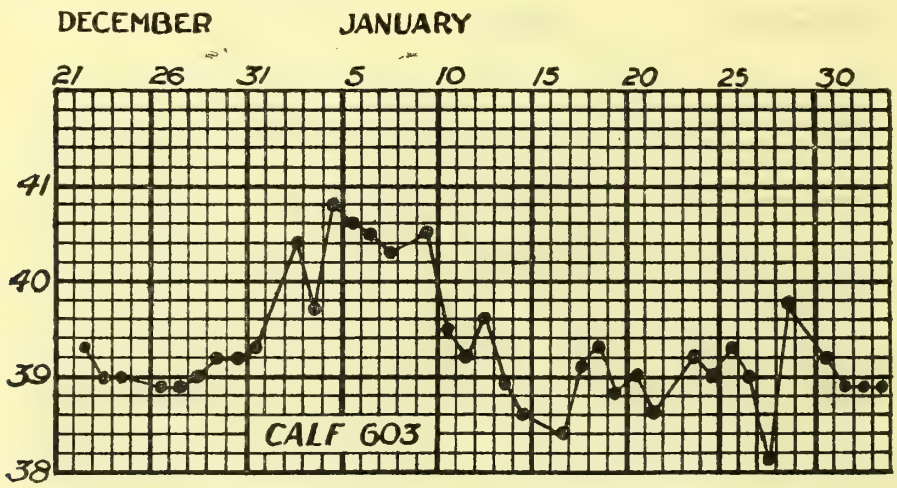
The calf was inoculated on December 21st, 1904.

A month later there was a swelling at the seat of inoculation measuring 5 in. by 3 in. The prescapular gland was enlarged, 3 in. long.

Two months after inoculation the swelling measured 5 in. by 3 in., and the gland 2½ in. by 2 in.

On March 21st, 1905, 90 days after inoculation, the calf was killed. With the exception of a slight constitutional disturbance immediately following the inoculation, it had remained in good health during the experiment.

Temperature.



From the beginning of February the temperature was normal.

Weights.

The calf did not grow at all during the experiment.

	cwt.	qrs.	lbs.	
December 21st, 1904 - -	1	0	27	Inoculated.
January 3rd, 1905 - -	1	0	18	
January 17th, 1905 - -	1	0	20	
January 31st, 1905 - -	1	0	21	
February 14th, 1905 - -	1	0	25	
February 28th, 1905 - -	1	1	2	
March 14th, 1905 - -	1	1	5	
March 21st, 1905 - -	1	1	0	Killed.

Total gain of weight during experiment.—1 lb.

Tuberculin Test.—The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—The tumour at the seat of inoculation on the right side of the neck was about 3¼ in. long by 1½ in. broad. It consisted externally of dense fibrous tissue, on the inner surface of which caseo-calcareous tissue surrounded a cavity which communicated with the exterior.

Right Prescapular Gland.—Measured 2 in. by 1¼ in. It consisted principally of a large caseo-calcareous mass which occupied the greater part of the gland.

Left Prescapular Gland.—Normal.

Prepectoral Glands.—The right prepectoral gland was the size of a cherry (¾ in. in diameter), and similar in structure to the right prescapular. The left was normal.

Axillary Glands.—Normal.

Thorax.

Pleura, Lungs, Thoracic Glands, Heart.—Normal.

Abdomen.

Peritoneum, Omentum, Intestines, Mesenteric Glands, Spleen, Liver, Hepatic Glands, Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Pharyngeal, Hyoid.—Norma.

Tongue, Palate, Tonsils, Pharynx.—Normal.

VIRUS H 34. "C.U."

CERVICAL GLANDS. (Operation.)

NOTE—The material used in this experiment consisted of some Cervical Glands removed in Hospital by operation on October 12th, 1902. No notes of the patient could be obtained.

VIRUS H 34. "C.U."

CERVICAL GLANDS.

CULTURE INOCULATION.

29th December, 1904.

Strain derived from human cervical glands, through guinea-pig 236.

Total duration of artificial cultivation : nearly 2 years.

Sub-cultures used for injection : 21 days old, on pure serum and agar-serum.



BULL-CALF 579.

Subcut.

Dose : 50 mg.

Killed : March 28, 1905.

89 days.

Small local lesion ; fewsmall caseous foci in nearest glands, (L T.)

RABBITS.

225	10·0 mg.	K. 88 days	Very slight tuberculosis of peritoneum, lungs and kidney.
224	1·0 mg.	K. 88 days	Very slight tuberculous peritonitis. Fibrous tubercles in lungs. Slight tuberculosis of kidneys.



BULL-CALF 581.

Subcut.

Dose : 50 mg.

Killed : March 28, 1905.

89 days.

Small abscess at seat of inoculation.

Caseous nodules in prescapular gland.

Prepectoral gland caseous throughout.

(L.T.)

CALF 579. (Virus H 34. "C.U.")

Subcutaneous Inoculation of Culture derived from human cervical glands, through Guinea-pig 236.

Dose—50 milligrammes.

Date—December 29th, 1904.

Weight at Inoculation—1 cwt. 0 qrs. 3 lbs. Age about 10 weeks.

Killed—March 28th, 1905. [89 days after inoculation.]

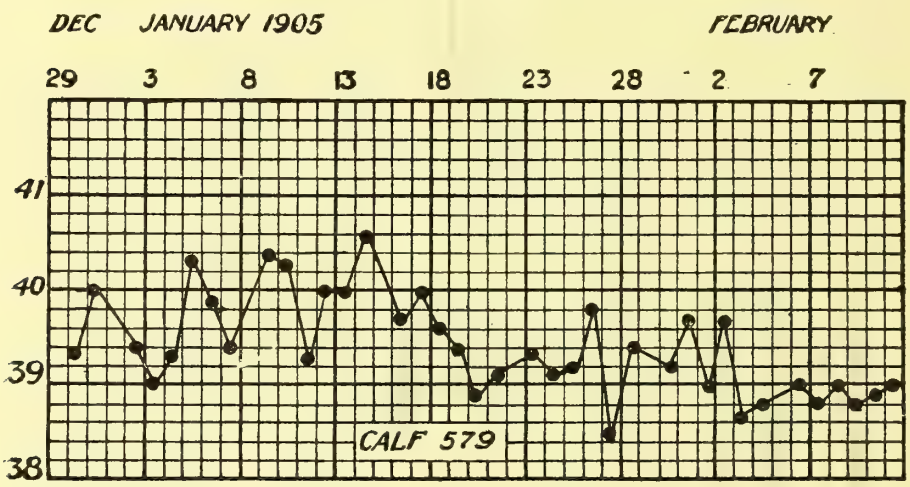
Clinical Notes.

The calf was inoculated on December 29th, 1904. Three weeks later there was a swelling at the seat of inoculation measuring 6 in. by 2½ in. The right prescapular gland was slightly enlarged.

Six weeks after inoculation the swelling measured 5 in. by 3 in. The gland was not distinguishable.

On March 28th, 89 days after inoculation, the calf was killed. It had remained perfectly well during the experiment.

Temperature.



From February 11th to March 28th the temperature remained approximately normal.

Weights.

The animal gained weight steadily but somewhat slowly during the experiment.

	cwt.	qrs.	lbs.	
December 29th, 1904 - -	1	0	3	Inoculated.
January 3rd, 1905 - -	1	0	7	
January 17th, 1905 - -	1	0	10	
January 31st, 1905 - -	1	0	21	
February 14th, 1905 - -	1	1	1	
February 28th, 1905 - -	1	1	12	
March 14th. 1905 - - -	1	1	14	
March 28th, 1905 - - -	1	1	21	Killed.

Total gain of weight during experiment.—1 qr. 18 lbs.

Average gain of weight per week.—3·6 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was an elongated swelling 4 in. by ⅞ in. by ½ in., composed of a pinkish white fibrous tissue, and containing a multilocular cavity full of thick pus. There were a few outlying purulent foci in the subjacent muscle.

Right Prescapular Gland.—Was normal in size, and almost normal in structure. It contained only a few caseous foci, which did not exceed the size of a large pin's head, just under the capsule.

Left Prescapular Gland.—Normal.

Prepectoral Glands.—The right prepectoral gland contained a caseous focus the size of a small pea. The left was normal.

Axillary Glands.—Normal.

Thorax.

Pleura, Lungs, Thoracic Glands, Heart.—Normal.

Abdomen.

Peritoneum, Omentum, Intestines, Mesenteric Glands, Spleen, Liver, Hepatic Glands, Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

CALF 581. (Virus H 34. "C.U.")

Subcutaneous Inoculation of Culture derived from human cervical glands, through Guinea-pig 236.

Dose—50 milligrammes.

Date—December 29th, 1904.

Weight at Inoculation—1 cwt. 0 qr. 18 lbs. (Age about 12 weeks.)

Killed—March 28th, 1905. [89 days after inoculation.]

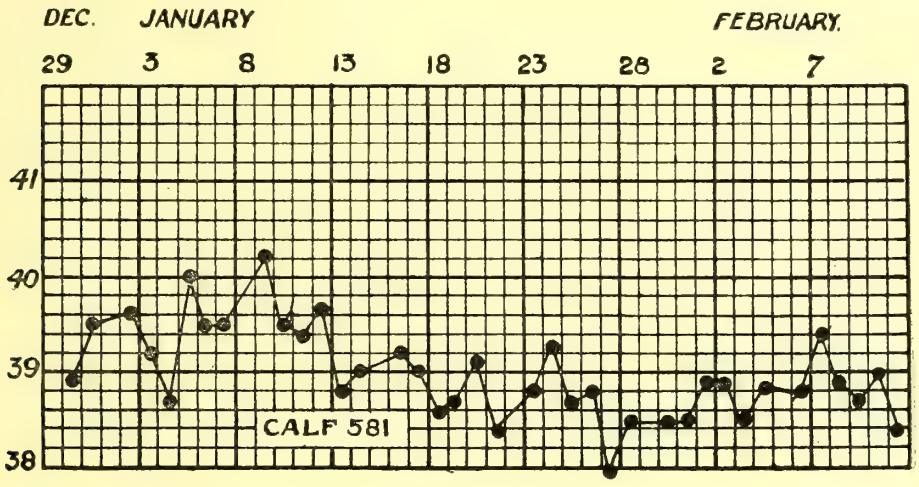
Clinical Notes.

The calf was inoculated on December 29th, 1904. Three weeks later there was a swelling at the seat of inoculation measuring 4 in. by 2½ in. The right prescapular gland was slightly enlarged.

Six weeks after inoculation the swelling measured 3½ in. by 2½ in., and the gland was still a little enlarged.

On March 28th, 1903, 89 days after inoculation, the calf was killed. It had remained well during the whole period of the experiment.

Temperature.



Weight.

The calf gained weight steadily during the experiment.

	cwt.	qrs.	lbs.	
December 29th, 1904 - -	1	0	18	Inoculated.
January 3rd, 1905 - - -	1	0	22	
January 17th, 1905 - -	1	0	22	
January 17th, 1905 - -	1	0	26	
January 31st, 1905 - -	1	1	11	
February 14th, 1905 - -	1	1	18	
February 28th, 1905 - -	1	2	3	
March 14th, 1905 - -	1	2	7	
March 28th, 1905 - - -	1	2	17	Killed.

Total gain of weight during experiment.—1 qr. 27 lbs.

Average rate of gain per week.—4·3 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Seat of Inoculation.—At the seat of inoculation on the right side of the neck was a tumour 3 in. by 2½ in. by 1 in., composed of a bilobed abscess cavity, containing softened caseous contents, and situated partly in the subcutaneous tissue, and partly in the subjacent muscle. The abscess cavity communicated with the exterior through an opening in the skin.

Right Prescapular Gland.—Was slightly enlarged. It contained two large and softened nodules at one end, and a smaller one, the size of a pea, at the other.

Right Prepectoral Gland.—The size of a cherry; was caseous and softened almost throughout, and its capsule was greatly increased in thickness.

There was only a trace of calcification in either gland.

Left Prescapular, Left Prepectoral and Axillary Glands.—Normal.

Thorax:

Thoracic Glands, Lungs, Pleura, Heart.—Normal.

Abdomen:

Omentum, Peritoneum, Liver, Hepatic Glands, Spleen, Kidneys, Suprarenals, Intestines, Mesenteric Glands; Renal, Lumbar, and Iliac Glands.—Normal.

Genito-Urinary System:

Testes.—Normal.

Special Glands:

Precrural, Popliteal, Gluteal, Ischiatic, Submaxillary, Pharyngeal, Parotid, Hyoid.—Normal.

Tongue, Pharynx, Palate, Tonsils.—Normal.

VIRUS H 35. "C.B."

BRONCHIAL GLANDS. (Post-Mortem).

VIRUS H 35. "C.B."

BRONCHIAL GLANDS.

CULTURE INOCULATION.

December 29, 1904.

Strain derived from human bronchial glands, through G.P. 1,571.

Total duration of artificial cultivation : 1½ years.

Sub-cultures used for injection : 21 days old, on pure serum, agar-serum, and glycerin-serum.



BULL CALF 585.

Subcut.

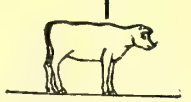
Dose : 50 mg.

Killed, March 29, 1905 (90 days).

Small caseous abscess at seat of inoculation. Calcareous nodules in nearest glands (L.T.)

RABBITS.

226	1 mg.	K. 89 days	Very slight tuberculous peritonitis. Fibrous tubercles in lungs.
227	10 mg.	K. 89 „	Slight tuberculosis of peritoneum, lungs, kidneys, and testes.
228	50 mg.	89 „	Very slight tuberculosis of peritoneum, lungs, kidneys and testes.



COW-CALF 605.

Subcut.

Dose : 50 mg

Killed, March 29, 1905 (90 days).

Small tumour at seat of inoculation. Nearest glands only slightly affected. 12 minute tubercles in lung, one in a thoracic gland, and two in a mesenteric gland (S.T.).

VIRUS H 35. "C.B."

C.B., a Male Child, aged about Five Years, admitted to Hospital on May 14th, 1903, and Died Four Days later.

Family History.—There was a history of phthisis on the father's side.

Clinical History.—The child had been ill for one week, suffering from sickness and constipation, and showing signs of photophobia.

On admission he was in a comatose state. There was occasional twitching of the left side, the head was thrown back, and there was right external squint. The temperature was 98° F.

No improvement took place in the condition, and the child died on the fourth day after admission, the cause of death being certified as acute miliary tuberculosis.

POST-MORTEM EXAMINATION.

Abdomen.

Peritoneum and Omentum.—Studded with miliary tubercles. There was no fluid in the peritoneal cavity.

Liver.—Studded on the surface with tubercles. Some tubercles seen in the substance of the organ on section.

Spleen.—Studded all over the surface with tubercles. On section the organ was full of miliary tubercles.

Kidneys.—Right kidney studded with tubercles. Left normal.

Mesenteric Glands.—Enlarged and hard.

Thorax.

Lungs.—There were some pleuritic adhesions at the base of the right lung. The apex of the lung was studded with recent tubercles, with a softened caseous mass in the centre. On the left side there were some old pleuritic adhesions, and the apex of the lung was studded with recent tubercles.

Bronchial Gland.—One gland was found to be much enlarged.

Cranium.

Meninges of Brain.—The meninges showed patches of miliary tubercle, with small tubercles running along the course of the blood-vessels.

DESCRIPTION OF TISSUES RECEIVED AT BLYTHWOOD FARM.

Meninges, portions of Lungs, Bronchial Gland, Spleen, Omentum, Peritoneum, Mesenteric Glands.

The Mesentery.—Was studded all over with little prominent tubercles, some quite loosely attached, the largest being $\frac{3}{16}$ in. in diameter, flat and mushroom-shaped.

The Mesenteric Glands.—Were composed of caseating nodules in a fibrous stroma. The largest of these glands measured $\frac{1}{3}$ to $\frac{1}{2}$ in. in diameter.

Bronchial Glands.—One of the bronchial glands was as large as a walnut, part being caseous and the rest densely fibrous.

CALF 585. (Virus H 35. "C.B.")

Subcutaneous Inoculation of culture derived from human bronchial glands through Guinea-Pig 1571.

Dose—50 milligrammes.

Date—December 29th, 1904.

Weight at Inoculation—1 cwt. 0 qrs. 1 lb.

Killed—March 29th, 1905. [90 days after inoculation.]

Clinical Notes.

The calf was inoculated on December 29th, 1904.

Three weeks later there was an ulcerated swelling at the seat of inoculation measuring 4 by 2½ in. The right prescapular gland was slightly enlarged.

Four weeks after inoculation the swelling opened and discharged, and the lesion healed. A fortnight later it was represented by a small area of thickening only. The calf was killed on 29th March, 90 days after inoculation. It had remained apparently well during the whole period of the experiment.

Temperature.

With the exception of a rise of about 1° C. on the tenth day, the temperature remained practically normal throughout.

Weight.

The animal gained but little in weight during the experiment.

	cwt.	qrs.	lbs.	
December 29th, 1904	1	0	1	Inoculated.
January 3rd, 1905	0	3	24	
January 17th, 1905	0	3	24	
January 31st, 1905	1	0	4	
February 14th, 1905	1	0	9	
February 28th, 1905	1	0	14	
March 14th, 1905	1	0	13	
March 28th, 1905	1	0	13	Killed the following day.

Total gain of weight during experiment.—12 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a depressed opening in the skin, which communicated with a small fibrous-walled cavity or sinus, with caseous contents. In the fibrous tissue around were several caseo-calcareous nodules.

Right Prescapular Gland.—Scarcely enlarged. It contained three calcareous nodules the size of small peas.

Left Prescapular Gland.—Normal.

Prepectoral Glands.—The right was the size of a large pea, and was almost entirely occupied by a calcareous nodule. The left was normal.

Axillary Glands.—Normal.

Thorax.

Pleura, Lungs, Thoracic Glands, Heart.—Normal.

Abdomen.

Peritoneum, Omentum, Intestines, Mesenteric Gland Spleen, Liver, Hepatic Glands, Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

CALF 605. (Virus H 35. "C.B.")

Subcutaneous Inoculation of culture derived from bronchial glands through Guinea-Pig 571.

Dose—50 milligrammes.

Date—December 29th, 1904.

Weight at Inoculation—1 cwt. 0 qrs. 0 lbs.

Killed—March 29th, 1905. [90 days after inoculation.]

Clinical Notes.

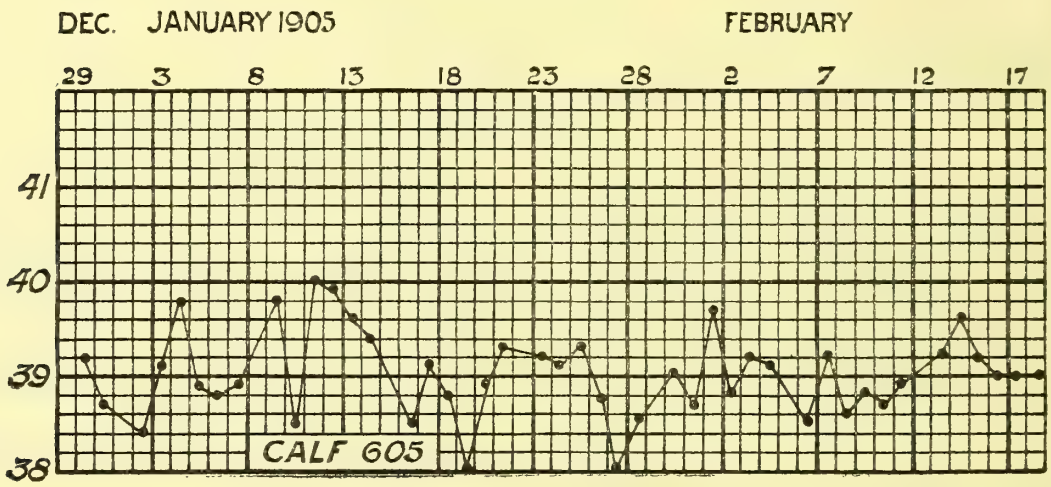
The calf was inoculated on December 29th, 1904. Three weeks later there was a swelling at the seat of inoculation, measuring 4½ in. by 3 in., and the right prescapular gland was slightly enlarged.

Six weeks after inoculation the swelling measured 5 in. by 3½ in. and was prominent and soft. The gland was still only slightly enlarged.

On March 29th, 1905, 90 days after inoculation, the calf was killed.

With the exception of a slight constitutional disturbance shortly after inoculation, the animal remained well during the experiment.

Temperature.



From February 19th, to March 29th, when the calf was killed, the temperature remained approximately normal.

Weights.

The increase of weight during the experiment was slow and irregular.

	cwt.	qrs.	lbs.	
December 29th, 1904 - -	1	0	0	Inoculated.
January 3rd, 1905 - -	0	3	25	
January 17th, 1905 - -	0	3	24	
January 31st, 1905 - -	1	0	4	
February 14th, 1905 - -	1	0	11	
February 29th, 1905 - -	1	0	20	
March 14th, 1905 - - -	1	0	25	
March 28th, 1905 - - -	1	0	21	Killed the following day.

Total gain of weight during experiment.—21 lbs.

Average rate of gain per week.—1·6 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a fluctuating tumour 4 in. by 2½ in. which contained softened caseous debris.

Right Prescapular Gland.—Was scarcely at all enlarged. It contained numerous discrete caseous points not larger than a small pin's head.

Left Prescapular Gland.—Normal.

Prepectoral Glands.—The right was the size of a small pea, and contained a relatively large calcareous nodule. The left was normal.

Axillary Glands.—Normal.

Thorax.

Pleura.—Normal.

Lungs.—Appeared to be normal, except for some small collapsed areas, but close inspection and careful search revealed a small number (twelve) of minute translucent grey foci under the pleura. These did not attain the size of a small pin's head, and in a few only could a minute opaque centre be seen.

Thoracic Glands.—Were not enlarged. In one of the smaller glands was a minute yellow focus, in which one tubercle bacillus was found.

Heart.—Normal.

Abdomen.

Peritoneum, Omentum, Intestines.—Normal.

Mesenteric Glands.—In these were found two very minute opaque points, but no tubercle bacilli could be found in them.

Spleen, Liver, Kidneys, Suprarenals, Renal Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Uterus.—Normal.

Special Glands.

Precrural, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Pharyngeal, Hyoid.—Normal.

Tongue, Palate. Tonsils, Pharynx.—Normal.

Microscopical Examination.

Thoracic Gland (Focus from).—One tubercle bacillus seen.

Mesenteric Gland (Focus from).—No tubercle bacilli seen.

VIRUS H 36. "M.D."

BRONCHIAL and MESENTERIC GLANDS. (Post-mortem.)

TABLE 36.

VIRUS H 36. "M.D."

BRONCHIAL GLAND.

January 11, 1905.



COW-CALF 591.
Subcut.
Dose: 15,585,000 T.B.
Killed April 15, 1905.
94 days.

P.M.—Small local lesion. Some small yellow tubercles in prescapular gland. **(L.T.)**

GUINEA-PIGS.

1475	Died	72 days	G.T.
1476	Killed	100 „	G.T.



BULL-CALF 621.
Subcut.
Dose: 15,585,000 T.B.
Killed April 15, 1905.
94 days.

P.M.—Caseous tumour at seat of inoculation. Fibro-caseous tubercles in prescapular gland. **(L.T.)**

TABLE 36a.

VIRUS H 36. "M.D."

MESENTERIC GLANDS.

CULTURE INOCULATION.

April 7th, 1905.

Culture derived from human mesenteric glands direct.

Total duration of artificial cultivation : three months.

The sixth subculture was used for injection, 21 days old, on pure serum and on glycerin serum, mixed.

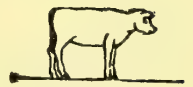


COW-CALF 687.
Subcut.
Dose : 50 mg.
Killed, July 6th, 1905
(90 days).

P.M.—Numerous small translucent tubercles in lungs : a few in kidneys : several in each suprarenal. Caseous foci in one or two mesenteric glands. (**S.T.**)

RABBITS.

347	50 mg.	Killed.	90 days.	Chronic tuberculous peritonitis. Trace in lungs.
348	10 mg.	„	„ „	Slight Tuberculosis of peritoneal and kidneys. Trace in lungs.
349	1 mg.	„	„ „	Very slight tuberculous peritonitis.



COW-CALF 735.
Subcut.
Dose : 50 mg.
Killed, July 7th, 1905
(91 days).

P.M.—Dry scab and sinus filled with thick pus at seat of inoculation. Caseo-calcareous lesions in nearest glands. (**L.T.**)

VIRUS H 36. "M.D."

M.D.,—Male Child, aged Four Years and Nine Months, admitted to Hospital on December 13th, 1904, suffering from Diarrhœa. Died of Meningitis on January 9th, 1905.

Family History.—There was a distinct family history of tubercle. The father was stated to be consumptive. The paternal grandfather and one uncle died of consumption, and the maternal grandmother was also tuberculous.

Clinical History.—The child was admitted for diarrhoea. For fourteen days before admission he had suffered from loss of appetite, with occasional vomiting and cough. Some loss of power had been noted in the left arm and leg. Four months previously the child had suffered from measles.

On admission the child seemed to be somewhat anæmic. It was generally restless and fretful, but at times drowsy. In showed evident signs of rickets, and enlarged lymphatic glands could be detected in the neck, axilla and groins. The left side of the chest moved badly. The breath sounds were louder over the right apex than on the left side, but no crepitations could be heard. There was no squint. The pupils were equal, and reacted normally, and no tubercles could be seen on ophthalmological examination. There was loss of power in the left arm and leg, and occasional incontinence of urine. The urine was normal. The liver was enlarged; the spleen could not be felt.

A few days after admission the child complained of pain around the umbilicus. It was very apathetic, and vomited after food given by the mouth. By the end of December he was greatly emaciated, and very ill indeed. There had been frequent convulsions, and at various times blood in bright red clots had been passed by the intestines.

The child became more unconscious; the percussion note over both apices became dull, and a few crepitations could be heard, and the air entered with difficulty into the left lung.

POST-MORTEM EXAMINATION.

Cranium.—Tubercles were scattered over the meninges, chiefly on the upper surface.

Thorax.

Lungs.—Both lungs contained scattered patches of grey tubercle, but no cavities.

Bronchial Glands,—Enlarged and caseating, more particularly the glands at the root of the left bronchus.

Abdomen.

Peritoneum.—Healthy.

Intestines.—Extensively ulcerated.

Liver.—Normal.

Spleen —Contained a few scattered tubercles.

Kidneys.—The right contained an irregular suppurating patch, about the size of a small bean. The left was normal.

Mesenteric Glands.—Enlarged and caseating.

DESCRIPTION OF MATERIAL RECEIVED AT BLYTHWOOD.

Mesenteric Glands.—All were enlarged and caseating. Those near the border of the mesentery were the size of small peas, and separated from each other. Towards the root of the mesentery was a continuous chain of glands, much enlarged, the individual glands being from half to three-quarters of an inch in diameter.

Spleen.—Eight or nine yellow spherical tubercles, the size of mustard seeds, were seen.

Lung.—A portion of lung only was received. It contained some translucent grey tubercles, irregular in shape, about a sixteenth of an inch in diameter. The tubercles showed on section minute yellow points.

Bronchial Glands.—Much enlarged, three or four of them being over an inch in their greatest diameter. Most of them were caseous, but in others the disease was slightly less advanced.

Microscopical Examination.

Separate emulsions were made of all the material.

Emulsion of Mesenteric Glands.—Tubercle bacilli few in number.

Emulsion of Bronchial Glands.—Tubercle bacilli more numerous.

Emulsion of Lung.—Tubercle bacilli not numerous.

Emulsion of Spleen.—Tubercle bacilli seen in clumps.

CALF 591. H 36. "M.D."

Subcutaneous—Inoculation of emulsion of human bronchial glands.

Dose—15,585,000 tubercle bacilli.

Date—January 11th, 1905.

Weight at Inoculation—1 cwt. 0 qrs. 4 lbs. (Age about 10 weeks.)

Killed—When in good health, April 15th, 1905. 94 days after inoculation.

Clinical Notes.

The calf was inoculated on January 11th, 1905. Three weeks later there was a trace of thickening at the seat of inoculation, and the right prescapular gland was a little enlarged.

On February 14th, all trace of swelling at the seat of inoculation had disappeared.

On April 15th, 94 days after inoculation, the calf was killed when in good health. It had shown no sign of illness during the experiment.

Temperature.

The temperature remained approximately normal throughout.

Weights.

The calf gained weight steadily during the experiment.

	cwts.	qrs.	lbs.	
January 11th, 1905 -	1	0	4	Inoculated.
January 31st, 1905 -	1	0	14	
February 28th, 1905 -	1	0	25	
March 28th, 1905 -	1	1	4	
April 15th, 1905 - -	1	1	15	Killed.

Total gain of weight during experiment.—1 qr. 11 lbs.

Average rate of gain per week.—2·9 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—There was no tumour at the seat of inoculation on the right side of the neck, but on reflecting the skin a number of small yellow tubercles could be seen, each about the size of a mustard seed, scattered over an area about as large as one's hand.

Right Prescapular Gland.—Was not enlarged. Through its capsule could be seen a number of yellow points not exceeding a pin's head, arranged in groups. These were found to be caseous, but only very slightly gritty.

Left Prescapular Gland, Right Prepectoral Gland, Axillary Glands.—Normal.

Thorax :

Pleura, Lungs, Thoracic Glands, Heart.—Normal.

Abdomen :

Peritoneum, Omentum, Intestines, Mesenteric Glands, Spleen, Liver, Hepatic Glands, Kidneys, Suprarenals. Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System :

Uterus, Mamma, Supramammary Glands.—Normal.

Special Glands :

Precrural, Pubic, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

CALF 621. (H 36. "M.D.")

Subcutaneous—Inoculation of emulsion of human bronchial glands.

Dose—15,585,000 tubercle bacilli.

Date—January 11th, 1905.

Weight at Inoculation—3 qrs. 26 lbs. (Age about 9 weeks.)

Killed—When in good health, April 15th, 1905. 94 days after inoculation.

Clinical Notes.

The calf was inoculated on 11th January, 1905. Three weeks later there was slight thickening at the seat of inoculation, and the right prescapular gland was a little enlarged.

On 14th February, 5 weeks after inoculation, the condition of the local lesion and of the prescapular gland was unchanged.

On 15th April, 94 days after inoculation, the calf was killed. With the exception of slight constitutional disturbance immediately following the inoculation, the animal was in good health during the period of the experiment.

Temperature.

The temperature remained approximately normal during the experiment; it was, however, somewhat irregular.

Weights.

The animal gained weight steadily during the experiment.

	cwt.	qrs.	lbs.	
January 11th, 1905 -	0	3	26	Inoculated.
January 31st, 1905 -	1	0	5	
February 28th, 1905 -	1	0	19	
March 28th, 1905 -	1	1	10	
April 15th, 1905 - -	1	1	20	Killed.

Total gain of weight during experiment.—1 qr. 22 lbs.

Average rate of gain per week.—3·6 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—At the seat of inoculation, on the right side of the neck, there was a softened caseous tumour the size of a walnut.

Left Prescapular Gland.—Normal.

Right Prepectoral Gland.—Could not be found.

Axillary Glands.—Normal.

Thorax :

Pleura, Lungs, Thoracic Glands, Heart.—Normal.

Abdomen :

Peritoneum, Omentum, Intestines, Mesenteric Glands.—Normal.

Spleen, Liver, Hepatic Glands, Kidneys, Suprarenals, Renal Glands. Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System :

Testes.—Normal.

Special Glands :

Precrural, Pubic, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

CALF 687. (H 36. "M.D.")

Subcutaneous—Inoculation of culture derived from the mesenteric glands of the same patient whose bronchial glands were used in a fresh state for the inoculation of Calves 591 and 621.

Dose—50 milligrammes.

Date—April 7th, 1905.

Weight at Inoculation—3 qrs. 21 lbs. (Age about 8 weeks.)

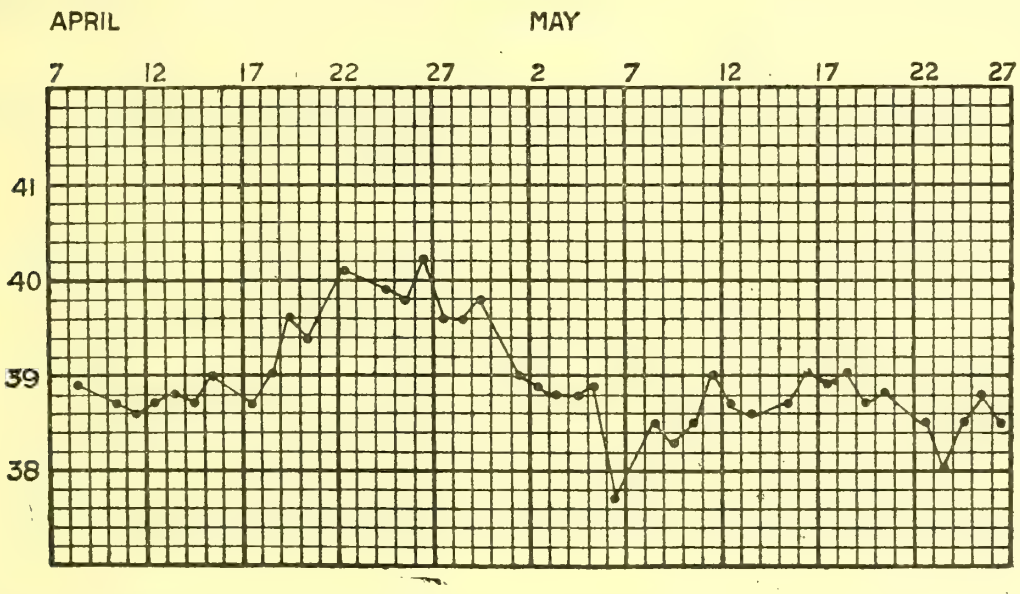
Killed—When in good health. July 6th, 1905. 90 days after inoculation.

Clinical Notes.

The calf was inoculated on April 7th, 1905.

On July 6th, 90 days after inoculation, the calf was killed. It had remained in fairly good health during the experiment, but it did not grow, and always appeared thin. The development of the swelling at the seat of inoculation, and of the nearest lymphatic glands, was similar to that usually seen in calves inoculated with viruses of Group II.

Temperature.



From May 27th to July 6th, a period of six weeks, the temperature remained normal.

Weights.

The weight was stationary during the period of the experiment.

	qrs.	lbs.	
April 7th, 1905 - - - -	3	21	Inoculated.
July 6th, 1905 - - - -	3	19	Killed.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Thin.

Local Lesion.—At the seat of inoculation, on the right side of the neck, the skin was puckered around a dry scab, covering a sinus filled with thick caseo-pus.

Right Prescapular Gland.—Was moderately enlarged, and contained a salmon-pink caseo-necrotic nodule an inch in diameter, commencing to soften at the margin.

Left Prescapular Gland.—Normal.

Right Prepectoral Gland.—Was as large as a small cherry, and was caseo-necrotic throughout.

Axillary Glands.—Normal.

Thorax :

Pleura.—Normal.

Lungs.—Both lungs were pale in colour, and contracted well. They were everywhere faintly but rather thickly mottled with little irregular perfectly translucent foci, which being hard could readily be felt. These were uniformly and rather thickly distributed throughout both lungs, but did not seem to have seriously affected their function.

The lungs did not at all resemble those affected with virulent tubercle bacilli, but recalled those which occurred with the H 18, "T.T." virus.

Thoracic Glands, Heart.—Normal.

Abdomen :

Peritoneum, Omentum.—Normal.

Intestines.—The intestines showed some soft elevations in the mucous membrane, in no way esembling tubercles.

Mesenteric Glands.—In one or two of these glands there were groups of small caseous foci just under the apsule.

Spleen, Liver, Hepatic Glands.—Normal.

Kidneys.—Both kidneys were small and granular, especially the left. The capsule was adherent.

In the left were found several translucent bodies with opaque centres, about the size of small shot, looking very much like tubercles, but placed unusually in the pyramidal part of the medulla.

One was found in the right.

Suprarenals.—Each contained several small tubercles.

Renal Glands, Lumbar Glands, Iliac Glands, Ischiatic Glands.—Normal.

Genito-Urinary System:

Uterus, Mamma, Supramammary Glands.—Normal.

Special Glands:

Precrural, Gluteal, Popliteal, Submaxillary, Parotideal, Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

Microscopical Examination.

Tubercle from Lung.—Tubercle bacilli.

Tubercle from Kidney.—Tubercle bacilli, three seen.

CALF 735. (H 36. "M.D.")

Subcutaneous—Inoculation of culture derived from the mesenteric glands of the same patient whose bronchial glands were used in a fresh state for the inoculation of Calves 591 and 621.

Dose—50 milligrammes.

Date—April 7th, 1905.

Weight at Inoculation—3 qrs. 19 lbs. (Age about 8 weeks.)

Killed—When in good health, July 7th, 1905. 91 days after inoculation.

Clinical Notes.

The calf was inoculated on April 7th, 1905. On July 7th, 1905, 91 days later, it was killed.

It had remained perfectly well during the experiment. The development of the local swelling and of the neighbouring lymphatic gland was similar to that usually seen in calves inoculated with a virus of human Group II.

Temperature.

The temperature remained approximately normal during the experiment.

Weights.

The calf did not grow well during the experiment.

	Cwt.	qrs.	lbs.	
April 7th, 1905 - - -	0	3	19	Inoculated.
July 7th, 1905 - - -	1	0	22	Killed.

Total gain of weight during experiment.—1 qr. 3 lbs.

Average rate of gain per week.—2·4 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a depressed scab leading to a small sinus, surrounded by dense fibrous tissue and containing thick pus.

Right Prescapular Gland.—Was moderately enlarged, and contained two caseo-necrotic and slightly calcareous lesions.

Left Prescapular Gland.—Normal.

Right Prepectoral Gland.—The size of a small cherry, was similar to the right prescapular gland.

Axillary Glands.—Normal.

Thorax:

Pleura,.—Normal.

Lungs.—Were studded with numerous minute red points, hæmorrhages (?).

Thoracic Glands, Heart.—Normal.

Abdomen:

Peritoneum, Omentum.—Normal.

Intestines, Mesenteric Glands, Spleen, Liver, Hepatic Glands, Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System:

Mamma, Supramammary Glands.—Normal.

Special Glands:

Precrural, Gluteal, Ischiatic Popliteal, Submaxillary, Parotideal, Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

VIRUS H 37. "O.J."

CERVICAL GLANDS. (Operation.)

VIRUS H. 37. "O.J."

CERVICAL GLANDS.

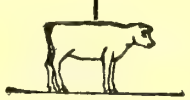
CULTURE INOCULATION.

January 13, 1905.

Strain derived from human cervical glands, after passage through four generations of guinea-pigs.

Total duration of artificial cultivation, 2½ months.

Subculture used for injection, 21 days old, on glycerin-serum.



BULL-CALF 627.

Subcutaneous.

Dose : 50 mg.

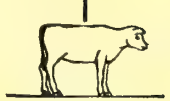
Killed, April 13, 1905.

(90 days).

P.M.—Abscess at seat of inoculation. Caseo-calcareous nodules in prescapular gland. Few minute tubercles in lungs. **(S.T.)**

RABBITS.

238	1·0 mg.	K. 90 days	Very slight tuberculous peritonitis. Few tubercles in lungs.
239	10·0 mg.	„ 90 „	Very slight tuberculosis of peritoneum and kidneys. Some tubercles in lungs.
240	50·0 mg.	„ 90 „	Slight tuberculosis of peritoneum and kidneys. Extensive tuberculosis of lungs.



COW-CALF 629.

Subcutaneous.

Dose : 50 mg.

Killed, April 13, 1905.

(90 days.)

P.M.—Thickening of skin only at seat of inoculation. Few caseous foci in prescapular gland. Few calcareous grains in mesenteric glands. **(S.T.)**

VIRUS H 37. "O.J."

O.J., Male, aged Six Years and Four Months, admitted to Hospital on May 27th, 1904, suffering from Enlarged and Suppurating Cervical Glands. Operation: May 28th, 1904.

Family History.—Father was said to be suffering from phthisis, but there was no other history of tubercle in the family. Several other children, brothers and sisters of the patient, were alive and in good health.

Clinical History.—No information could be obtained as to the method of feeding or other details of the child's previous history.

Seven weeks before admission a swelling was noticed on the left side of the neck. This swelling had become painful and harder, but had not increased in size. No other swelling had been noticed.

On admission an enlarged gland could be felt on the right side of the neck, and also a fluctuating swelling, apparently due to the breaking down of one or more soft glands.

An operation was performed the day after admission. A small abscess cavity was opened, and an enlarged and softened cervical gland was removed from the right side of the neck.

DESCRIPTION OF MATERIAL RECEIVED AT BLYTHWOOD.

One Cervical Gland.—The gland on section was found to be gelatinous in structure, and contained little caseo-purulent patches, On microscopic examination of an emulsion made from this gland no tubercle bacilli could be detected. Guinea-pigs injected with it, however, became tuberculous.

Subsequent History of Patient.

The patient was visited on October 22nd, 19 months after the operation. The wound on the right side of the neck had completely healed, and no enlarged glands could be detected on examination.

The mother stated that the child had been quite well since the operation, and it appeared to be in excellent health.

CALF 627. (Virus H 37. "O.J.")

Subcutaneous Inoculation of culture derived from human cervical glands, after passage through four generations of guinea-pigs.

Dose—50 milligrammes.

Date—January 13th, 1905.

Weight at Inoculation—1 cwt. 0 qrs. 5 lbs.

Killed—April 13th, 1905. 90 days after inoculation.

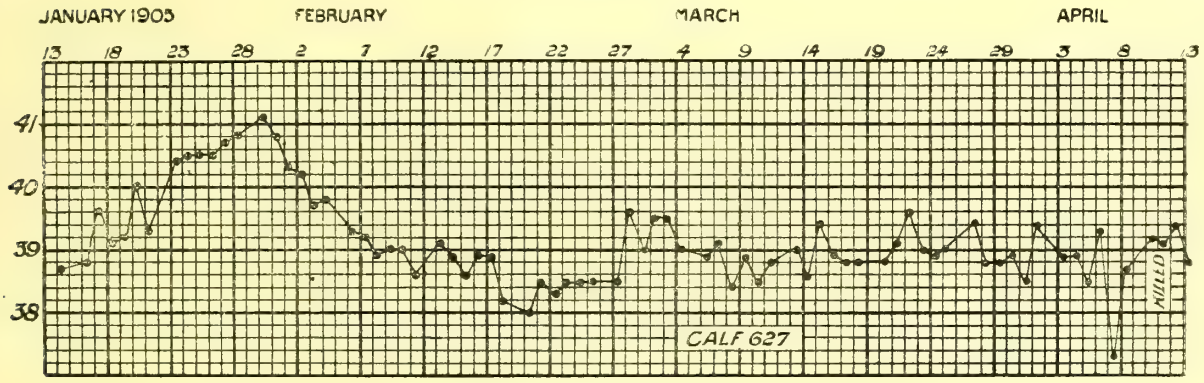
Clinical Notes.

The calf was inoculated on January 13th, 1905. Seven days later there was a swelling at the seat of inoculation measuring 3½ in. by 2 in. The right prescapular gland was slightly enlarged.

On the 18th day the swelling was large, hot, and a little tender, measuring 7½ in. by 3½ in. The gland was considerably enlarged, 4 in. by 2 in.

On the 32nd day the swelling had diminished a little in size and measured 6½ in. by 3½ in. The gland was unchanged. On April 13th, 90 days after inoculation, the calf was killed. It had remained apparently in good health during the entire period of the experiment.

Temperature.



Weights.

The calf gained weight very slowly during the experiment.

	cwts.	qrs.	lbs.	
January 13th, 1905 - -	1	0	5	Inoculated.
January 31st, 1905 - -	1	0	13	
February 14th, 1905 - -	1	0	21	
February 28th, 1905 - -	1	0	24	
March 14th, 1905 - - -	1	0	25	
March 28th, 1905 - - -	1	0	22	
April 13th, 1905 - - -	1	1	0	Killed.

Total gain of weight during experiment.—23 lbs.
Average gain of weight per week.—1·7 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—The tumour at the seat of inoculation was hemispherical and fluctuating. It contained a central cavity, with turbid fluid and caseous débris, and ragged caseous walls.

Right Prescapular Gland.—Was slightly enlarged, two and a quarter inches long. It contained three caseous and slightly calcareous nodules, the largest about 1½ in. in long diameter.

Left Prescapular Gland, Right Prepectoral Gland.—Normal.

Axillary Glands.—Normal.

Thorax.

Pleura.—Normal.

Lungs.—The right anterior lobe was collapsed and carnified, and contained one pea-sized nodule with softened interior, and another similar, but smaller portion of the left lobe was also collapsed. The bronchi leading to these areas contained much thick mucus. In the posterior part of the right lung, in a single lobule, were four minute translucent grey tubercles (?), each with a faint suggestion of a central opacity. In the left lung a single similar tubercle, without central opacity, was found; when picked out on the point of a knife it was found to be gritty.

Thoracic Glands, Heart.—Normal.

Abdomen.

Peritoneum, Omentum, Intestines, Mesenteric Gland, Spleen, Liver, Hepatic Glands, Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Popliteal, Ischiatic, Submaxillary, Parotideal, Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

Microscopical Examination.

Softened Contents of Nodule in Carnified Lobe of Lung. (Two films examined).—No tubercle bacilli.

CALF 629. (Virus H 37. "O.J.")

Subcutaneous Inoculation of culture derived from human cervical glands after passage through four generations of guinea-pigs.

Dose—50 milligrammes.

Date—January 13th, 1905.

Weight at Inoculation—3 qrs. 15 lbs.

Killed—April 13th, 1905. 90 days after inoculation.

Clinical Notes.

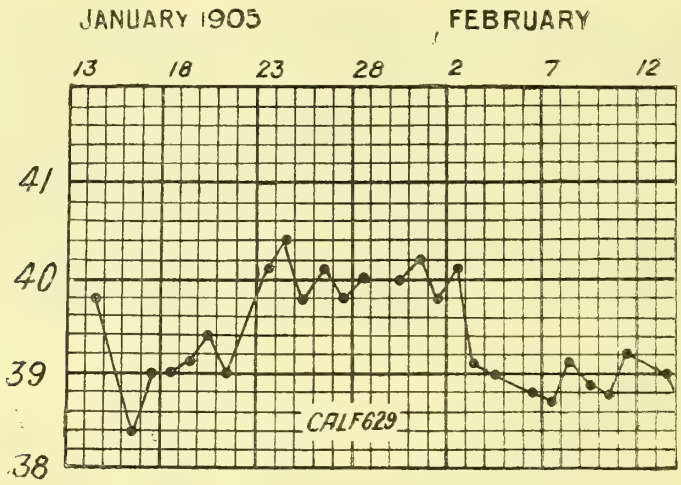
The calf was inoculated on January 13th, 1905. Eight days later there was a swelling at the seat of inoculation measuring 4 in. by 2 in. The right prescapular gland was slightly enlarged.

The swelling and gland rapidly increased in size; on the 18th day they measured together 9 in. by 5 in., the former extending into the dewlap. An ill-defined sulcus separated the gland from the lesions.

On the 28th day there was a small opening in the swelling, through which a serous fluid was discharging. Both swelling and gland subsequently decreased in size.

On April 13th, 90 days after inoculation, the calf was killed. It had remained well during the entire period of the experiment.

Temperature.



From February 12th to April 13th, when the calf was killed, the temperature remained approximately normal.

Weights.

The calf gained weight steadily during the experiment.

	cwts.	qrs.	lbs.	
January 13th, 1905 - -	0	3	15	Inoculated.
January 31st, 1905 - -	1	0	4	
February 14th, 1905 - -	1	0	15	
February 28th, 1905 - -	1	0	26	
March 14th, 1905 - - -	1	1	0	
March 28th, 1905 - - -	1	1	6	
April 13th, 1905 - - -	1	1	15	Killed.

Total gain of weight during experiment.—2 qrs.

Average rate of gain per week.—4.3 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—At the seat of inoculation the local lesion had ulcerated, and there was little to be seen besides hair matted together by discharge.

On section a soft caseous mass the size of a pea, and a few calcareous grains, were found embedded in thickened skin.

Right Prescapular Gland.—Contained a little group of caseous foci.

Left Prescapular Gland, Right Prepectoral Gland, Axillary Glands.—Normal.

Thorax.

Pleura, Lungs, Thoracic Glands, Heart.—Normal.

Abdomen.

Peritoneum, Omentum, Intestines.—Normal.

Mesenteric Glands.—Contained a few minute calcareous tubercles.

Spleen, Liver, Hepatic Glands, Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Uterus, Udder, Supramammary Glands.—Normal.

Special Glands.

Precrural, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

VIRUS H 38. "J.M."

CERVICAL GLAND. (Post-mortem.)

VIRUS H 38. "J.M."

CERVICAL GLANDS.

CULTURE INOCULATIONS.

I.—January 18, 1905.

Strain derived from human cervical glands, through G.P. 1793.

Total duration of artificial cultivation, over 14 months.

Subculture used for injection, 21 days old, on pure serum and glycerin-serum.



BULL-CALF 643.
Subcutaneous.
Dose, 50 mg.
Died February 15, 1905
(28 days).
P.M.—General tuberculosis, severe.

RABBITS.

250	1 mg	D. 22 days	Early G.T.
251	10 mg.	„ 15 „	G.T.
252	50 mg.	„ 15 „	G.T.

See page .



BULL-CALF 647.
Subcutaneous.
Dose, 50 mg.
Died February 19 1905.
(32 days).
P.M.—General tuberculosis, severe.

II.—June 23, 1905.

Strain derived from same source.

Total duration of artificial cultivation, 19½ months.

13th subculture on pure serum used for injection, 21 days old.



BULL-CALF 827.
Subcutaneous.
Dose, 10 mg.
Killed, October 9, 1905.
108 days.
General tuberculosis, slight.

RABBITS.

488	10 mg.	D. 10 days	G.T.
489	1. mg.	„ 17 „	„
490	0·1 mg.	„ 19 „	„
491	0·01 mg.	„ 23 „	„

GUINEA-PIGS.

1580	1· mg.	D. 14 days	G.T.
1581	1. mg.	„ 16 „	„
1582	0·1 mg.	„ 21 „	„
1583	0·1 mg.	„ 21 „	„



COW CALF 845.
Subcutaneous.
Dose, 10 mg.
Killed, when dying, July 29, 1905.
36 days.
General tuberculosis, severe.

VIRUS H. 38. "J.M."

CERVICAL GLAND.

CULTURE INOCULATIONS—*continued.*

III.—September 4, 1905.

Strain derived from human cervical glands, through G.P. 1793.

It was grown for 3 generations on glycerin-serum media, then sown on pure serum and the resulting growth used for injection after 21 days. This experiment was designed in order to test whether the Virus H. 38. "J.M." were a mixture or no.



BULL-CALF 887.

Subcutaneous.

Dose : 23 mg.

Killed when dying : October 7, 1905.

33 days.

General tuberculosis, severe.

RABBITS.

591	10 mg.	Died, 57 days	G.T. Injection largely intramuscular.
592	1· „	„ 17 „	G.T.
593	1· „	„ 39 „	G.T.
594	1· „	„ 10 „	G.T.

VIRUS H 38. "J.M."

"J.M.," A Child Aged One Year and Three Months. Died of Non-Tuberculous Broncho-Pneumonia on October 12th, 1903.

Family History.—No record was obtained of the family history of this child, or of its clinical history previous to admission to hospital.

The case was not diagnosed during life. The child died apparently of broncho-pneumonia.

POST-MORTEM EXAMINATION.

Lungs.—Showed no evidence, either by naked-eye appearance or on microscopic examination, of tuberculosis.

Peritoneum.—The whole peritoneum was studded with tubercles of various sizes,as was also the peritoneal side of the diaphragm.

Intestines.—There were numerous ulcers in the small intestine, but no perforation.

Mesenteric Glands.—Many of the mesenteric glands were enlarged, one being caseous.

DESCRIPTION OF MATERIAL RECEIVED AT BLYTHWOOD.

1. A *Portion of Lung* showing areas of collapse, dark pinkish or blue-grey in colour, and depressed below the surface of the air-containing portion. There was no sign of tubercle in it.

2. A *Bronchial Gland*, darkly congested, without sign of tubercle.

3. A *Portion of Intestine* showing a large ulcer with raised edges.

4. A *Group of Mesenteric Glands* with yellowish-white caseous nodules.

5. A *Cervical Lymphatic Gland* (submaxillary) about $\frac{7}{8}$ in. in length, congested; on section seen to be composed of dense cream-coloured nodules occupying the greater part of the gland, and separated by darkly congested softer tissue.

The cervical gland only was used for experiment.

CALF 643. (Virus H 38. "J.M.")

Subcutaneous Inoculation of culture derived from human cervical glands through Guinea-Pig 1793.

Dose—50 milligrammes.

Date—January 18th, 1905.

Weight at Inoculation—3 qrs. 21 lbs.

Died—February 15th, 1905. [28 days after inoculation.]]

Clinical Notes.

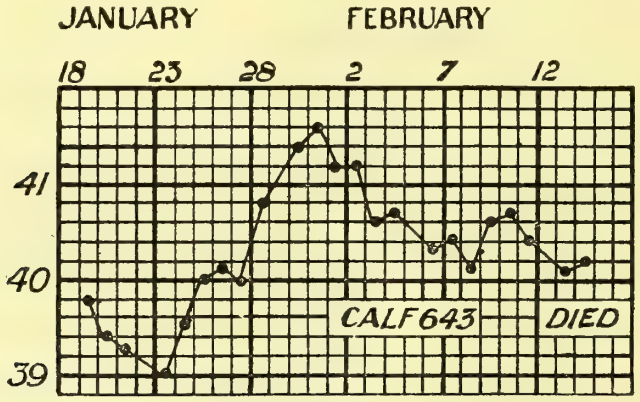
The calf was inoculated on January 18th, 1905. Thirteen days later there was a large tumour at the seat of inoculation, measuring 8 in. by 4 in. The right prescapular gland was enlarged and measured $3\frac{1}{2}$ in. by $2\frac{1}{2}$ in.

On the twentieth day the tumour was enormous, reaching to the bottom of the dewlap. The animal was unwell, standing huddled up with arched back, and resting against the wall.

On the twenty-seventh day it was much worse, and its breathing was forcible and laboured. The tumour measured $9\frac{1}{2}$ in. by $5\frac{1}{2}$ in., and the gland was 5 in. in length.

The following day, February 15th, 28 days after inoculation, the calf died.

Temperature.



Weights.

The loss of weight was not so great as is usual in similar cases.

	cwt.	qrs.	lbs.	
January 18th, 1905	0	3	21	Inoculated
January 31st, 1905	0	3	24	
February 15th, 1905	0	3	12	Died.

Total loss of weight during experiment.—9 lbs.

Average rate of loss per week.—2·25 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Very thin.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a pear-shaped tumour, the narrow end being in the most dependent part of the dewlap. There was a considerable amount of œdema in the dewlap, extending as far back as the anterior margin of the thorax The tumour was firmly adherent to skin and muscle weighed 14 ozs.. and measured 7 in. by 4 in. by $1\frac{3}{4}$ in. On section the overlying skin was, around the margins, seen to be much thickened, but in the centre the skin was replaced almost entirely by the extension of the caseous substance from below. The thickened skin was white and tough, and minute caseous points were freely scattered about in it. Beneath the skin was a thick layer of white caseous matter, traversed by pink and purple striæ. Underlying this again was a muscular layer which, like the layer above, was not sharply distinguishable from the caseous material, but gradually faded off, through a layer in which individual tubercles were thickly distributed throughout the muscle, into the ordinary muscular tissue, which was œdematous. In the most bulky part of the lesion there was a small loculated cavity, situated in the caseous layer.

Right Prescapular Gland.—Measured $3\frac{1}{2}$ in. by $2\frac{1}{4}$ in. by $1\frac{1}{2}$ in., and weighed 4 ozs. The surface was smooth. On section it was pale, with minute pink and purple points and striæ, and was caseous throughout, except for a narrow strip in the centre, where a certain amount of normal gland tissue remained, infiltrated by caseous points.

Left Prescapular Gland.—Was congested and œdematous, and contained minute foci.

Right Prepectoral Glands.—One, circular, and relatively very large, had a thickened capsule, and was caseous throughout. The reniform gland, which was very œdematous, contained a very few tubercles in the cortex, each surrounded by a circumscribing area of congestion.

Axillary Glands.—Were congested and œdematous, and contained minute foci.

Thorax.

Pleura.—Was normal.

Diaphragm.—On the surface were many congested tufts, in one or two of which small caseous tubercles were found. The peritoneal surface was normal.

Lungs.—Were heavy, very dark in colour, and weighed 4 lbs. 13 ozs. They would barely float in water. The upper lobes were pneumonic, and sank in water, and practically the only air-containing portions of the lungs were the hinder dorsal portion of the posterior lobes, and this part of the lung was very voluminous. Over the whole surface of the organ small discrete circumscribed tubercles were very thickly scattered; they were made up of a grey translucent outer part and a whitish opaque centre. On section small tubercles were extraordinarily numerous

throughout the organ, and even in the hinder lobes there was a considerable amount of congestion.

Trachea.—Minute irregular spots of congestion, in a few of which a minute white tubercle could be seen, were visible along the upper 6 in. of the trachea.

Thoracic Glands.—The left bronchial was mottled, areas of congested gland substance delimiting white areas of caseation. In the purple gland substance small caseous tubercles were by no means few. Of other bronchial glands, and glands lying in the arch of the aorta, some were similar to the left bronchial, while in others œdema was very marked, but no caseation beyond a few minute tubercles could be seen. The glands in the posterior mediastinum were large, very œdematous, and dark in colour, and the change consisted in small caseous foci scattered mainly in the cortex, where, in the most affected, it formed a distinct layer in the most superficial part of the gland. The peribronchial gland was caseous, except for a small congested central area, where the gland tissue was infiltrated with small discrete tubercles.

Pericardium.—There were some small grey translucent raised tubercles on the outer surface of the parietal pericardium. One or two hæmolymph glands lying on the pericardium contained tubercles. (These were distributed mainly along the phrenic nerve, but were also seen in other situations.)

Endocardium.—There was a doubtful speck in the endocardium of the right ventricle.

Heart.—There was considerable œdema in the auriculo-ventricular groove. One minute tubercle (?) was found on the surface of the heart, close to the auriculo-ventricular groove.

Abdomen.

Peritoneum, Omentum.—Normal.

Stomach.—Small white glistening points were seen from the outer surface. When the stomach was opened, these were seen to be small white projecting tubercles, not thickly scattered about, but nevertheless numerous.

Intestines.—Here and there in the small intestine a small indistinct tubercle was found.

The large intestine was normal.

Mesenteric Glands.—Were œdematous and somewhat congested. There were minute tubercles in the majority of the glands, but few in number in each gland.

Spleen.—On section the structure of the spleen was coarse; no tubercles were with certainty distinguishable.

Liver.—Large numbers of whitish tubercles, some minute and indistinct, others large and white, were visible all over the surface. A similar condition was seen on section.

Hepatic Glands.—Were œdematous, and some contained on section large caseous projecting tubercles. In one of the glands only minute tubercles were found in the cortex; another was caseous throughout.

Kidneys.—Were œdematous. Whitish tubercles were scattered over the surface in fairly large number, and were equally numerous on section.

Suprarenals.—Two or three quite small tubercles were found in the right; one in the left.

Renal Glands.—Were congested and œdematous, and contained minute foci.

Lumbar Glands, Iliac Glands.—All were congested and œdematous; in some there were one or two minute foci; in others they were more numerous.

Special Glands.

Precrural, Gluteal, Ischiatic, Popliteal.—All were congested and œdematous; in some there were one or two minute foci, in others they were more numerous.

Submaxillary, Parotideal, Pharyngeal, Hyoid.—All were much congested, and contained small caseous points.

Tongue, Palate, Tonsils.—Normal.

Larynx.—Nothing abnormal seen.

Eyes.—Normal.

Microscopical Examination.

Tubercle from Endocardium of Heart.—Tubercle bacilli, four seen.

Tubercle from Surface of Heart.—No tubercle bacilli.

Tubercle from Stomach.—Tubercle bacilli.

Tubercle from Small Intestine.—Tubercle bacilli few.

Tubercle from Mesenteric Gland.—Tubercle bacilli.

Tubercle from Left Suprarenal.—Tubercle bacilli.

CALF 647. (Virus H 38. "J.M.")

Subcutaneous Inoculation of culture derived from human cervical glands, through Guinea-Pig 1793.

Dose—50 milligrammes.

Date—January 18th, 1905.

Weight at Inoculation—3 qrs. 21 lbs.

Died—February 19th, 1905. [32 days after inoculation.]

Clinical Notes.

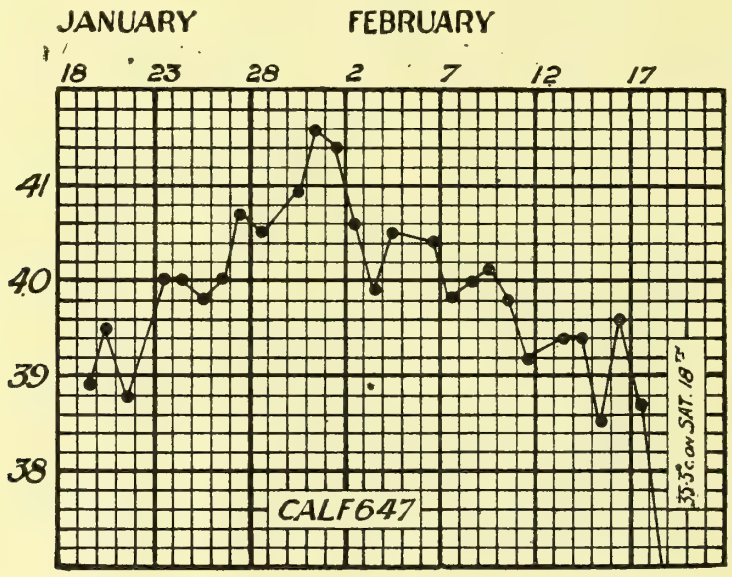
The calf was inoculated on January 18th, 1905.

On the 13th day after inoculation there was a tumour at the seat of inoculation measuring 5½ in. by 4 in. The right prescapular gland was about the size of a large walnut.

On the 21st day the tumour opened and discharged, leaving a large deep ulcer.

On the 27th day the tumour measured 7½ in. by 5 in., the ulcer was healing. The prescapular gland was considerably enlarged. The animal was ill. It rapidly grew worse, and was found to be in a dying condition on the 31st day, the temperature being below 36°C. It died on the following day, February 19th, 32 days after inoculation.

Temperature.



Weights.

The loss of weight in this calf, as in its fellow, 643, was not so great as is usual in similar cases.

	qrs.	lbs.	
January 18th, 1905 - - -	3	21	Inoculated.
January 31st, 1905 - - -	3	22	
February 19th, 1905 - - -	3	11	Died.

Total loss of weight during experiment.—10 lbs.

Average rate of loss per week.—2·3 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Thin.

Local Lesion.—The tumour at the seat of inoculation, on the right side of the neck, measured 5 in. by 3½ in. by 1½ in., and weighed 8 ozs. It was pear-shaped, tapering below. On the surface was a hollowed ulcer 1 in. in diameter, covered by a scab, which on section was found to be connected with a ragged cavity filled with greenish brown thick pus. The cavity lay in the central caseous layer. The skin over the tumour was much thickened, and infiltrated with small tubercles, and over the thickest part of the lesion it was replaced by caseous material. The caseous layer, at its widest part, measured nearly one and a half inches, and beneath it was the muscle infiltrated with small tubercles, the line of demarcation between the caseous layer and the muscle being ill-defined.

Right Prescapular Gland.—Measured 3½ in. by 1¾ in. by 1¼ in., and weighed 2 ozs. The surface was smooth, and on section the gland was almost entirely caseous, only a narrow strip of gland tissue remaining, and this was infiltrated with small caseous tubercles. A second much smaller gland, lying closely adjacent to the above, was practically caseous throughout.

Left Prescapular Gland.—Congested. One or two minute tubercles were seen.

Right Prepectoral Glands.—The circular gland was rather more than one inch in diameter, and was caseous throughout. The reniform gland was enlarged and very œdematous, and contained one or two very small tubercles.

Left Prepectoral Glands.—The circular gland contained two small tubercles, the reniform three or four.

Axillary Glands.—Were congested. One or two minute tubercles were seen.

Cervical Glands.—Right cervical glands were little, if at all, larger than normal; all contained a few caseous tubercles. Left cervical was congested, and contained one or two tubercles.

Thorax.

Pleura, Diaphragm.—Normal.

Lungs.—The lungs were very heavy and voluminous, barely floated in water, and weighed 3 lbs. 13 ozs. The upper lobes of the left lung were almost entirely consolidated, and only a narrow strip of air-containing tissue was left along the dorsal margin. The upper part (almost half) of the lower lobe was similarly consolidated.

The upper and middle lobes of the right lung were airless, with the exception of a narrow strip along the dorsal margin. Small whitish tubercles, with grey margins, were very numerous all over the surface of the organ.

On section the left lung was found to be deeply congested in the air-containing part. The right lung, though congested, was less affected than the left. In both tubercles were as numerous as on the surface.

Trachea.—On the upper part of the trachea minute colourless tubercles were numerous.

Thoracic Glands.—The left bronchial gland was œdematous and was caseous in places, especially in the cortex.

Of various glands in the neighbourhood of the bronchi, some contained a few caseous areas; others were almost entirely caseous.

The glands in the posterior mediastinum were congested and œdematous, and contained small areas of caseous tuberculous deposit.

Two peribronchial glands on the right side were almost entirely caseous, one on the left was less affected.

Pericardium.—Several tubercles and hæmo-lymph glands containing caseous foci, were found on the surface of the pericardium, in the neighbourhood of the phrenic nerve. There was a small group of tubercles on the inner surface of the parietal pericardium at the base of the left phrenic nerve. There was a small group of tubercles on the inner surface of the parietal pericardium, at the base of the left ventricle, on its posterior surface. Two were found on the visceral pericardium, close to the auriculo-ventricular groove.

Endocardium.—Was apparently healthy.

Heart.—In the connective tissues at the base of the heart several prominent caseous tubercles were found. One or two caseous tubercles, surrounded by small areas of congestion were found in the great vessels, close to their origins.

Abdomen.

Peritoneum, Omentum.—The omentum contained some prominent caseous tubercles. The omental glands were large, and contained two or three small tubercles in each.

Stomach.—White tubercles were found on the mucous membrane of the stomach, but were few in number. They were not visible from the peritoneal surface.

Oesophagus.—Normal.

Intestines.—In the lower part of the small intestine tubercles were very numerous. In the large intestine, and particularly in the cæcum, they were also present in large numbers.

Mesenteric Glands.—Were enlarged, and some a little congested. They all contained caseous tuberculous deposit, in some cases only very small foci, in others a much more extensive affection was found.

Spleen.—The Malpighian tufts were large, firm, and prominent. No tubercles could with certainty be distinguished.

Liver.—Tubercles were fairly numerous on the surface, varying in size from a pin's head downwards, white in colour; on section similar tubercles were seen, apparently more numerous than those on the surface.

Hepatic Glands.—Were enlarged, and contained a considerable amount of caseous deposit.

Kidneys.—A few tubercles were present on the surface, and a few were seen on section. The latter had a well marked opaque centre and translucent margins.

Suprarenals.—Two small tubercles were found in each.

Renal Glands.—Contained several tubercles.

Lumbar Glands.—Contained many tubercles.

Iliac Glands.—Contained a few tubercles.

Special Glands.

Precrural.—Contained a few tubercles.

Gluteal.—Congested and œdematous; contained one or two minute tubercles.

Ischiatic.—The left was normal in size. Right not found. No tubercles seen in left.

A small hæmo-lymph gland, in the position of the right ischiatic, contained a tubercle.

Popliteal.—Congested. Contained one or two tubercles.

Submaxillary, Parotideal, Pharyngeal.—All were enlarged, congested, and contained some caseous tubercles.

Hyoid.—Were less affected.

Tongue, Palate.—Normal.

Tonsils.—Several small caseous tubercles were found.

Naso-Pharynx.—One (?) tubercle seen.

Larynx.—Normal.

Eyes.—Normal.

Microscopical Examination.

Right Tonsil.—Tubercle bacilli; short.

Left Tonsil.—Tubercle bacilli; few and short.

Naso-Pharynx.—No tubercle bacilli.

Spleen.—Tubercle bacilli; long.

Stomach.—Tubercle bacilli; few, short.

Duodenum.—Tubercle bacilli.

Ileum.—Tubercle bacilli.

Cæcum.—Tubercle bacilli; few, long.

CALF 827. (Virus H 38. "J.M.")

Subcutaneous Inoculation of culture derived from human cervical glands, through Guinea-Pig 1793.

Dose—10 milligrammes.

Date—June 23rd, 1905.

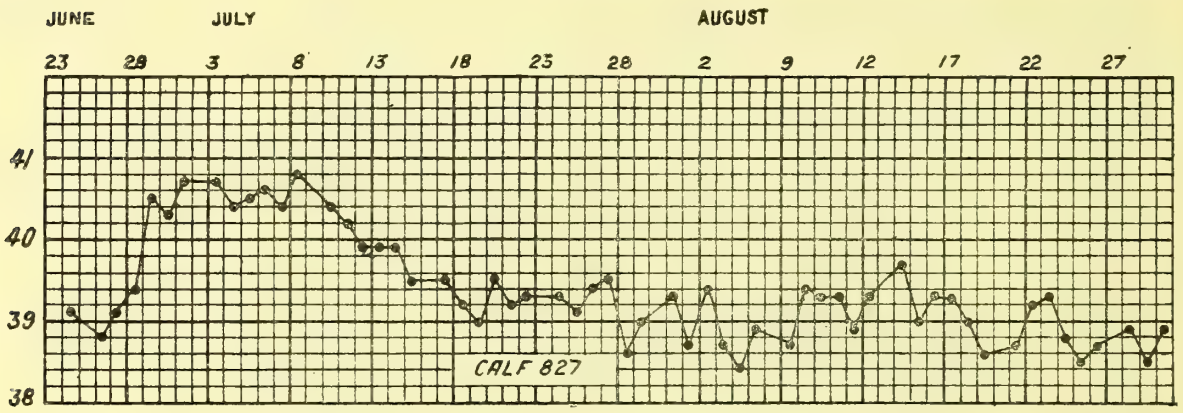
Weight at Inoculation—3 qrs. 18 lbs.

Killed—October 9th, 1905. [108 days after inoculation.]

Clinical Notes.

The calf was inoculated on June 23rd, 1905. It suffered from somewhat severe constitutional disturbance, accompanied by rise of temperature, at the commencement of the experiment, but soon recovered, and was in good health and good condition when killed on October 9th, 1905, 108 days after inoculation.

Temperature.



From August 30th, to October 9th, when the calf was killed, the temperature remained approximately normal.

Weights.

The increase of weight during the period of the experiment was but little below that usual in the case of a normal calf.

	cwt.	qrs.	lbs.	
June 23rd, 1905 - - -	0	3	18	Inoculated.
October 9th, 1905 - - -	1	1	7	Killed.

Total gain of weight during experiment.—45 lbs.

Average rate of gain per week.—2·9 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

Local Lesion.—At the seat of injection was a prominent rounded fluctuating tumour, which measured 5½ in. by 2¾ in. by 2 in. and weighed 8 ozs. It was composed of a ragged mass of salmon pink colour lying almost loose in a fibrous-walled cavity and contained purulent caseous matter. In the fibrous wall, including the skin over it, were a few calcareous grains, but it did not infiltrate in the manner usual with virulent viruses.

Right Prescapular Gland.—Was enlarged and measured 3½ in. by 1½ in. by 1¼ in. and weighed 3 ozs. Its cortex was chiefly composed of salmon pink caseo-necrotic matter, but about one-third was normal and translucent, and infiltrated with calcareous grains.

Left Prescapular Gland contained one softened tubercle.

Right Prepectoral Gland.—About one inch in diameter; was similar to the right prescapular.

Axillary Glands.—Normal.

Thorax.

Pleura.—Along the costal margins the villi were hypertrophied and here and there an occasional yellow tubercle was seen.

Lungs.—Collapsed well, and weighed only 1 lb. 9 ozs.

On the surface, particularly the diaphragmatic, the lymphatic villi were hypertrophied. Many little translucent grey tubercles, some with a minute opaque centre, were seen on the surface. These were exactly like those often seen with non-virulent viruses but were more numerous. The larger ones were distinctly calcareous.

Thoracic Glands.—Were only slighly enlarged. They contained rather numerous small yellow tubercles about one tenth of an inch in diameter. Many were partly softened and others were distinctly calcareous.

Heart.—Normal.

Abdomen.

Small Intestine.—A few yellow points were seen in the Peyer's patches.

Large Intestine.—Normal.

Mesenteric Glands.—Many glands contained one or more small caseous and slightly calcareous tubercles.

Spleen.—In the spleen a moderately large number of yellow tubercles of rather various size were seen, the largest about one eighth of an inch in diameter. They were rather soft and caseous. and slightly gritty when crushed.

Liver.—On the diaphragmatic surface of the liver the villi, which are usually invisible, were hypertrophied. No tubercles were seen on the surface, and none were found on section.

Portal Glands.—Contained small scattered tubercles.

Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Left Precrural.—Two tubercles.

Right Precrural.—Many large softened tubercles

Left Gluteal.—Three tubercles.

Right Gluteal.—Normal.

Right Ischiatic (left not seen).—Normal.

Left Popliteal.—Several softened tubercles.

Right Popliteal.—One small tubercle.

Submaxillary, Parotideal, Post-Pharyngeal.—Contained small scattered tubercles.

Hyoid.—Normal.

Tongue, Tonsils, Pharynx.—Normal.

Microscopical Examination.

Small Intestine (yellow focus from.)—Tubercle bacilli scanty.

CALF 845. (Virus H 38. "J.M.")

Subcutaneous Inoculation of culture from human cervical glands, through Guinea-Pig 1793.

Dose—10 milligrammes.

Date—June 23rd, 1905.

Weight at Inoculation—3 qrs. 8 lbs.

Killed—July 29th, 1905. [36 days after inoculation.]

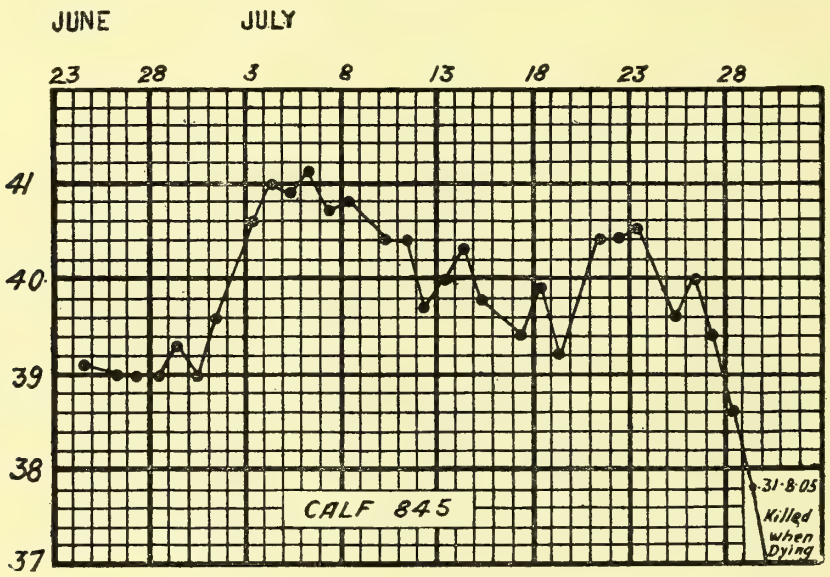
Clinical Notes.

The calf was inoculated on June 23rd, 1905.

The course of the disease in this animal was similar to that which usually follows a large dose of a virus virulent for bovines.

It was killed when in a dying condition on July 29th, 1905, 36 days after inoculation.

Temperature.



Weights

The calf lost one-fifth of its original weight during the experiment.

	qrs.	lbs.	
June 23rd, 1905 - - - - -	3	8	Inoculated.
July 29th, 1905 - - - - -	2	18	Killed.

Total loss of weight during experiment.—18 lbs.

Average rate of loss per week.—3·6 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Much emaciated.

Local Lesion.—At the seat of inoculation, on the right side of the neck, there was a solid flattened tumour, 5½ in. by 4 in. by 2 in., weighing 12 ozs. It was dense, salmon pink, and caseo-necrotic, with a small irregular central cavity containing serum. It infiltrated skin and subjacent muscle.

Right Prescapular Gland.—Much enlarged, measuring 4 in. by 1¾ in by 1½ in., and weighing 4 ozs. It was caseo-necrotic throughout.

Left Prescapular Gland.—Contained shotty tubercles, caseating at the centres.

Right Prepectoral Gland.—Was much enlarged, 1¼ in. in diameter, and was caseo-necrotic.

Left Axillary Glands.—No tubercles could be found.

Thorax.

Pleura.—There were lines of early tubercles along both the borders of several of the ribs on each side. There were also similar tubercles on the pleural surface of the diaphragm.

Lungs.—Contracted fairly well. A moderately large number of little tubercles could be seen on the surface. These varied in size, and though for the most part small, were already distinctly caseating.

Section showed the lung to be more severely affected than appeared from the surface. Tubercles similar to those on the surface were scattered throughout, often collected into little groups, and embedded in a translucent area of consolidation. Such areas were specially numerous in the right lung.

Trachea.—Normal.

Thoracic Glands.—Enlarged; surrounded by oedematous tissue, firm, translucent, grey, and infiltrated by a caseating network.

Heart.—The fat had been completely absorbed, and replaced by oedema. There was a little patch of roughness, probably caused by tuberculous deposit, on the dorsal surface of the right auricle, also a line of similar deposit along the inter-ventricular groove on the sternal surface, and a tubercle just beneath the pericardium on the dorsal surface of the right ventricle.

In the vena cava superior, just at the entrance into the auricle, were three minute translucent tubercles, projecting into the lumen of the vessel.

In the muscular wall of the right auricle a small tubercle was found.

Abdomen.

Peritoneum.—The omentum was studded with numerous lobulated tubercles, up to ⅛ in. in diameter, of a reddish colour, and loosely attached. They were distinctly caseating.

Small Intestine.—Small yellow tubercles were scattered somewhat sparsely throughout the lower part.

Large Intestine.—A few tubercles were seen in the caecum, and one or two in the colon.

Mesenteric Glands.—All glands contained one or more shotty tubercles caseating at the centres.

Spleen.—Was packed with rather large shot-sized tubercles, yellowish grey in colour.

Liver.—The surface was thickly studded with small tubercles, many of which were slightly raised. The largest was scarcely ⅛ in. in diameter. Section showed them distributed thickly throughout the organ.

Portal Glands.—Were enlarged, and similar to the thoracic.

Kidneys.—Showed a considerable number of pale small tubercles of various sizes on the surface, more numerous in

the left. A few were seen on section. The fat had disappeared from the hilum, and was replaced by oedema.

Suprarenals.—A single tubercle was found in the left, none in the right.

Renal Glands.—Packed with shotty tubercles caseating at the centres.

Lumbar Glands, Iliac Glands.—Contained shotty tubercles caseating at the centres.

Genito-Urinary System.

Uterus, Mammary Gland.—Normal.

Supramammary Glands.—Contained shotty tubercles caseating at the centres.

Special Glands.

Precrural, Gluteal, Right Ischiatic, Popliteal, Submaxillary, Post-Pharyngeal, Hyoid.—Contained shotty tubercles caseating at the centres.

Left Ischiatic.—No tubercles could be found.

Tonsils.—In each tonsil there were one or more caseating tubercles.

Pharynx.—In the corrugated mucous membrane which descends from the nasal septum on to the dorsal wall of the pharynx were several yellow tubercles.

Larynx.—On the laryngeal surface of the epiglottis was a small projection, probably a tubercle.

Eyes.—Normal.

Microscopical Examination.

Heart (Scraping from inter-ventricular groove).—Tubercle bacilli, only four seen.

Small Intestine (solid yellow focus).—Tubercle bacilli.

CALF 887. (Virus H 38. "J.M")

Subcutaneous Inoculation of culture derived from human cervical glands through Guinea-Pig 1793.

Dose—23 milligrammes.

Date—September 4th, 1905.

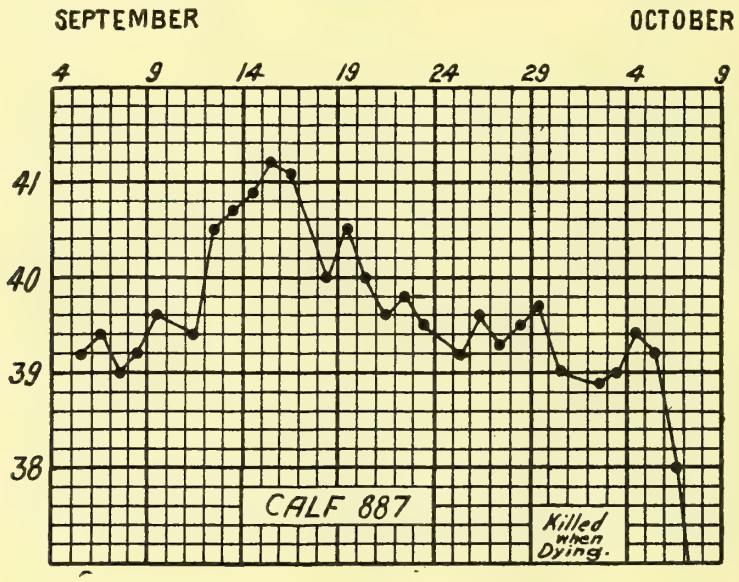
Weight at Inoculation—3 qrs. 18 lbs.

Killed—When dying, October 7th, 1905. [33 days after inoculation.]

Clinical Notes.

The calf was inoculated on September 4th, 1905. The course of the disease was similar to that usually seen in calves suffering from acute tuberculosis. The calf was killed when in a dying condition on October 7th, 33 days after inoculation.

Temperature.



Weights.

	qrs.	lbs.
September 4th, 1905 - - - -	3	18
October 7th, 1905 - - - -	3	15

Total loss of weight during experiment.—3 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Thin.

Local Lesion.—At the seat of inoculation was a solid fibro-necrotic tumour, which measured 5½ in. by 4¾ in. by 2½ in., and weighed 1 lb. 6 ozs. It infiltrated the skin and the subjacent muscle very extensively.

Right Prescapular Gland.—Was much enlarged, 3½ in. by 2½ in. by 1¾ in., and weighed 5 ozs. It was caseo-necrotic.

Left Prescapular Gland.—Contained a small number of tubercles.

Prepectoral Glands.—The right prepectoral glands were two in number. They were enlarged, and each of the size of a pigeon's egg. The spherical one, like the right prescapular, was dense and caseo-necrotic; the other was soft, and contained only small scattered tubercles.

Axillary Glands.—Contained a small number of tubercles.

Cervical Glands.—Two deep cervical glands were large and caseous.

Thorax.

Pleura.—Showed a good many small tubercles along the margins of the ribs.

Lungs.—Weighed 3 lbs. 12 ozs. The anterior parts (less than half) were red and solid, and studded with small grey tubercles. Section showed numerous small grey tubercles throughout, groups being often embedded in red translucent airless patches.

Trachea.—Normal.

Thoracic Glands.—Were much enlarged, their cortices being firm, grey and translucent, and packed with caseating foci.

Heart.—Normal.

Abdomen.

Peritoneum, Omentum.—Many tubercles could be seen on the omentum.

Intestines.—In the small intestine a few small yellow foci were seen in the Peyer's patches of the ileum. On section they were found to be soft and creamy.

Mesenteric Glands.—All contained several small tubercles.

Spleen.—Was packed with small tubercles.

Liver.—The liver was very full of small grey tubercles, the surface being studded by some which rose above it, while many others were visible through a greater or lesser thickness of liver tissue.

A very dense body, which resembled a large narrow seed, but was quite empty, was found in the falciform ligament, adherent to the left lobe of the liver.

Portal Glands.—Showed a general tuberculous change, their cortices being grey and dense, and packed with opaque foci.

Kidneys.—Contained a moderate number of small tubercles.

Suprarenals.—There were four small tubercles seen in the left; one in the right.

Renal and Lumbar Glands.—Contained numerous tubercles.

Iliac Glands.—Contained a smaller number of tubercles than the renal and lumbar glands.

Genito-Urinary System.

Testes.—One tubercle was seen in the right; the left was normal.

Special Glands.

Precrural, Pubic, Ischiatic, Gluteal.—Contained a variable, but smaller number of tubercles than the renal glands.

Submaxillary, Parotideal, Pharyngeal.—Contained scattered tubercles.

Hyoid.—The right hyoid (on the side of the inoculation) contained a large fibro-caseous nodule.

Tongue.—One tubercle was seen in the mucous membrane at the base of the tongue.

Tonsils.—There were three or four tubercles in each tonsil.

Pharynx.—Several small tubercles were seen in the dorsal wall of the pharynx.

Larynx.—Normal.

Microscopical Examination.

Yellow Focus from Intestine.—Tubercle bacilli numerous.

VIRUS H 30. "M.B."

CERVICAL GLANDS. (Operation.)

VIRUS H 39. "M.B."

CERVICAL GLANDS.

CULTURE INOCULATION.

January 18, 1905.

Strain derived from human cervical glands, direct.

Total duration of artificial cultivation : 3 months.

Subcultures used for injection ; on glycerin-serum, 10 and 21 days old.



BULL-CALF 623.

Subcut.

Dose : 50 mg.

Killed : April 19, 1905.

(91 days.)

Small abscess at seat of inoculation.

Nearest glands contain caseo-calcareous nodules. **(L.T.)**

RABBITS.

247	Dose : 1 mg.	Killed, 91 days.	Local lesion. Slight tuberculosis of lungs.
248	10 mg.	Died, 35 „	Slight tuberculosis peritonitis? Cause of death.
249	50 mg.	Killed, 91 „	Local tumour. Trace of tubercle in lungs and peritoneum.



BULL-CALF 637.

Subcut.

Dose : 50 mg.

Killed : April 19, 1905.

(91 days.)

Abscess at seat of inoculation.

Calcareous grains in prescapular gland. **(L.T.)**

VIRUS H 39. "M.B."

M.P., Male, aged Twelve Years, admitted to Hospital on September 30th, 1904, suffering from Enlarged Cervical Glands. Operation: October 21st, 1904

Clinical and Family History.—Beyond the fact that the child had suffered from rheumatism, no reliable details regarding the family history or any previous illnesses could be obtained.

On admittance a mass of enlarged lymphatic glands was felt on the left side of the neck, but these did not communicate in any way with the exterior, and the skin over them was normal in appearance.

The glands were removed by operation three weeks after admission. The wound healed, and the child was discharged cured.

DESCRIPTION OF MATERIAL RECEIVED AT BLYTHWOOD.

Cervical Glands.—One very large lymphatic gland about the size of a large walnut, and two smaller ones. The larger was softened, and was full of caseous débris and purulent matter. The cavity in which this was contained was found to have smooth walls after scraping away the solid matter which adhered to them, and these were provided with trabeculæ, resembling some of the local lesions seen in calves after subcutaneous inoculation. The two smaller glands were caseous.

On microscopical examination of a smear from the caseous interior of one of the glands, a few tubercle bacilli were seen. They were short and slender, and one or two showed polar bodies.

CALF 623. (Virus H 39. "M.B.")

Subcutaneous Inoculation of culture derived from human cervical glands direct.

Dose—50 milligrammes.

Date—January 18th, 1905.

Weight at Inoculation—1 cwt. 0 qr. 3 lbs.

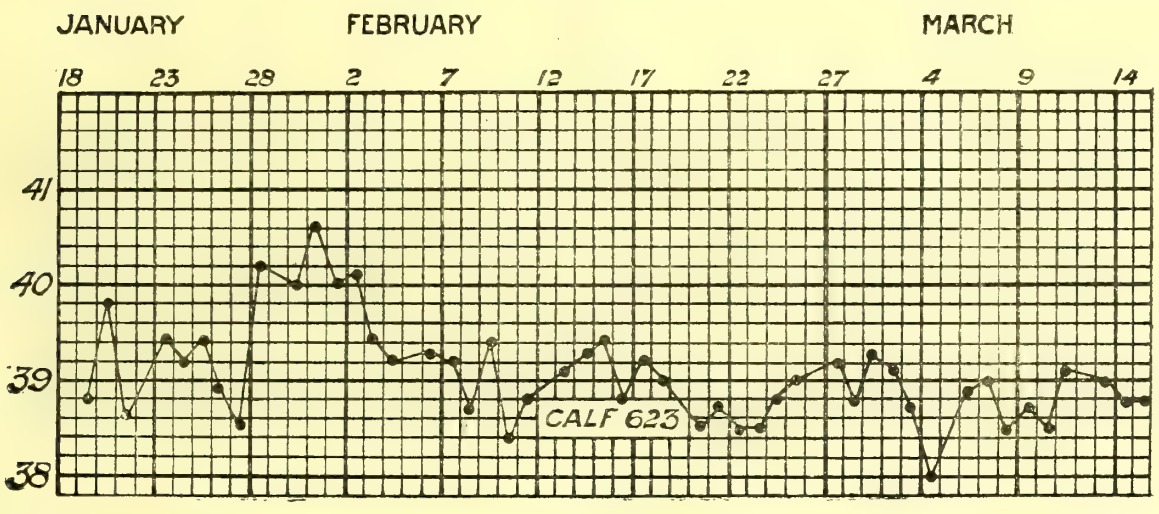
Killed—April 19th, 1905. 91 days after inoculation.

Clinical Notes.

The calf was inoculated on January 18th, 1905. Thirteen days later there was a tumour at the seat of inoculation measuring 6 in. by 4½ in. The right prescapular gland was enlarged, about the size of a large walnut. On the 27th day the swelling measured 4½ in. by 3 in., it was freely moveable on the subjacent muscle. The gland was considerably enlarged and measured 5 by 2 in.

On April 19th, 91 days after inoculation, the calf was killed. It had remained in good health during the whole period of the experiment.

Temperature.



From March 15th to April 19th when the calf was killed, the temperature remained approximately normal.

Weights.

The calf grew but little during the experiment.

	cwts.	qrs.	lbs.	
January 18th, 1905	1	0	3	Inoculated.
January 31st, 1905	1	0	14	
February 14th, 1905	1	0	23	
February 28th, 1905	1	1	3	
March 14th, 1905	1	1	3	
March 28th, 1905	1	1	4	
April 11th, 1905	1	1	6	
April 19th, 1905	1	1	12	Killed.

Total gain of weight during experiment.—1 qr. 9 lbs.

Average rate of gain per week.—2·8 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a rounded swelling, about 3 in. by 2 in., covered by scaly skin. On section a small abscess cavity containing thick pus was found, having thick fibrous walls lined with calcareous deposit.

Right Prescapular Gland.—Was slightly enlarged, and contained several caseo-calcareous nodules.

Left Prescapular Gland.—Normal.

Right Prepectoral Gland.—Was the size of a large shot, was caseo-calcareous almost throughout.

Axillary Glands.—Normal.

Thorax.

Pleura.—Normal.

Lungs.—In the right lung, on its dorsal surface, were seen two grey translucent bodies about the size of a large shot, slightly raised and hard, without any central opacity.

The lungs were otherwise normal.

Thoracic Glands.—Normal.

Heart.—Normal.

Abdomen.

Peritoneum, Omentum, Intestines, Mesenteric Glands, Spleen, Liver, Hepatic Glands, Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Pharyngeal, Hyoid.—Normal.

Tongue.—Normal.

Palate.—Normal.

Tonsils.—Normal.

Pharynx.—Normal.

Microscopical Examination.

Focus from Lung.—No tubercle bacilli.

CALF 637. (Virus H 39. "M.B.")

Subcutaneous Inoculation of culture derived from human cervical glands direct.

Dose—50 milligrammes.

Date—January 18th, 1905.

Weight at Inoculation—3 qrs. 9 lbs.

Killed—April 19th, 1905. 91 days after inoculation.

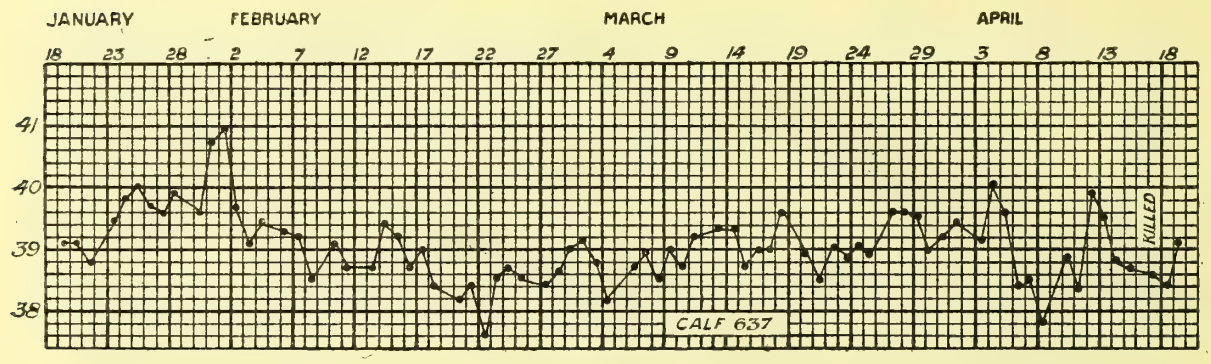
Clinical Notes.

The calf was inoculated on 18th January, 1905. Thirteen days later there was a swelling at the seat of inoculation measuring 5½ in. by 4½ in. The right prescapular gland was enlarged, about the size of a walnut.

On the 27th day the tumour measured 4½ in. by 3½ in., and was freely moveable on the subjacent muscle. The gland was still enlarged.

On 19th April, 91 days after inoculation, the calf was killed. It had remained apparently well during the whole period of the experiment, and was in good condition when killed.

Temperature.



Weight.

The calf grew but little during the experiment.

	cwts.	qrs.	lbs.	
January 18th, 1905 - -	0	3	9	Inoculated.
January 31st, 1905 - -	0	3	20	
February 14th, 1905 - -	0	3	21	
February 28th, 1905 - -	1	0	0	
March 14th, 1905 - - -	1	0	3	
March 28th, 1905 - - -	1	0	2	
April 19th, 1905 - - -	1	0	8	Killed.

Total gain of weight during experiment.—27 lbs.

Average rate of gain per week.—2 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a hemispherical swelling 4 in. by 3 in., containing a large thin-walled cavity with pink fibrous walls, bridged across by trabeculae, and containing a thin fluid full of caseous flakes and masses.

Right Prescapular Gland.—Scarcely at all enlarged; contained several little groups of calcareous grains in its cortex.

Left Prescapular Gland, Right Prepectoral Gland, Axillary Glands.—Normal.

Thorax.

Pleura.—Normal.

Lungs.—The anterior lobe of the right lung was extensively carnified. In it was a little pea-sized nodule, consisting of a fibrous wall and pultaceous contents.

The anterior lobe of the left lung was similarly, though less severely, affected. It contained a similar and larger nodule, and this portion of the lung was adherent to the pericardium. There was no sign of tubercle in the lung.

Thoracic Glands, Heart.—Normal.

Abdomen.

Peritoneum, Omentum, Intestines, Mesenteric Glands, Spleen, Liver. Hepatic Glands, Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

Microscopical Examination.

Pultaceous Matter from Lung.—No tubercle bacilli.

VIRUS H 40. "J.G."

TESTICLE (Operation).

VIRUS H 40. "J.G."

TESTICLE.

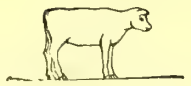
CULTURE INOCULATION.

January 20, 1905.

Strain derived from a human testicle, through G.P. 1439.

Tested for virulence after 6 weeks' artificial cultivation.

Culture used for injection: 1st subculture, 10 and 15 days old, on pure serum and glycerin-serum.



BULL-CALF 641.

Subcut.

Dose: 50 mg.

Killed, April 20, 1905

(90 days).

Abscess at seat of inoculation; calcareous nodules in prescapular gland. (L.T.)

RABBITS.

253	1 mg.	K. 90 days	Slight tuberculous peritoniitis. Numerous fibrous tubercles in lungs.
254	10 mg.	K. 90 „	Slight tuberculous peritonitis. Slight tuberculosis of kidneys. Trace in lungs.
255	50 mg.	K. 90 „	„ „ „



BULL-CALF 651.

Subcut.

Dose: 50 mg.

Killed when dying: March 22, 1905

(61 days).

Small local lesion: small caseo-calcareous nodules in nearest glands. Cause of death undetermined. (L.T.)

VIRUS H 40. "J.G."

J.G., Male, Aged Forty-three, Admitted to Hospital on August 8th, 1904, Suffering from Tuberculous Disease of the Testicle. Operation: November 17th, 1904.

Family History.—Unknown.

Clinical History.—The patient had suffered from cough and the usual signs of consumption for some considerable time before admission, but he had only recently complained of the testicle.

On admission the patient's general condition was bad, and cavities were detected on examination in both lungs. The condition of the testicle appeared to be due to tuberculous disease, and after having been under observation for some considerable time it was removed by operation three months after admission.

DESCRIPTION OF MATERIAL RECEIVED AT BLYTHWOOD.

At the lower end of the epididymis was a large caseous and partly softened mass, nearly an inch in its longest diameter. There was a similar, but smaller, mass at the upper end. The testicle itself was very soft, and contained a few small tuberculous foci.

Subsequent History of the Patient.

The patient died of phthisis one year after the operation.

CALF 641. (Virus H 40 "J.G.")

Subcutaneous—Inoculation of culture derived from human testicle through Guinea-pig 1479.

Dose—50 milligrammes.

Date—January 20th, 1905.

Weight at Inoculation—3 qrs. 25 lbs.

Killed—April 20th, 1905. [90 days after inoculation.]

Clinical Notes.

The calf was inoculated on January 20th, 1905. Eleven days later there was a hot swelling at the seat of inoculation, measuring 5 in. by 3 in. The right prescapular gland was the size of a large walnut. On the 25th day the swelling measured 4 in. by 3 in.; the gland was unchanged.

On April 20th, 90 days after inoculation, the calf was killed. It was in good condition, and had shown no signs of serious illness during the experiment.

Temperature.

Was irregular during the experiment, but no high temperatures were recorded, the maximum being 39·7°C.

Weights.

The increase in weight was slow, and somewhat irregular, during the experiment.

	cwts.	qrs.	lbs.	
January 20th, 1905 - -	0	3	25	Inoculated.
January 31st, 1905 - -	1	0	6	
February 14th, 1905 - -	1	0	10	
February 28th, 1905 - -	1	0	11	
March 14th, 1905 - -	1	0	7	
March 28th, 1905 - - -	1	0	11	
April 11th, 1905 - - -	1	0	21	
April 20th, 1905 - - -	1	0	26	Killed.

Total gain of weight during experiment.—1 qr. 1 lb.

Average rate of gain per week.—2·2 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—There was a fluctuating tumour, $3\frac{1}{2}$ in. by $2\frac{1}{4}$ in. at the seat of inoculation. On section a thin fibrous-walled cavity was seen, with softened caseo-purulent contents.

Right Prescapular Gland.—Scarcely at all enlarged; contained several calcareous nodules.

Left Prescapular Gland, Right Prepectoral Gland, Axillary Glands.—Normal.

Thorax.

Pleura, Lungs, Thoracic Glands, Heart.—Normal.

Abdomen.

Peritoneum, Omentum, Intestines, Mesenteric Glands, Spleen, Liver, Hepatic Glands.—Normal.

Kidneys.—A great part of the left kidney was contracted and granular. In the granular area was a nodule the size of a large pea, composed of a thick fibrous capsule enclosing a piece of necrotic tissue, the peripheral part of which was commencing to soften. In another place was a smaller nodule, which consisted almost entirely of a fibrous capsule with a very small softened centre. Besides this there were several still smaller nodules. Some gritty concretions were found in some of the calyces of the affected part.

Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

Microscopical Examination.

Nodule from Kidney (two films examined).—No tubercle bacilli; numerous short blue bacilli.

CALF 651. (Virus H 40. "J.G.")

Subcutaneous—Inoculation of culture derived from human testicle through Guinea-pig 1439.

Dose—50 milligrammes.

Date—January 20th, 1905.

Weight at Inoculation—3 qrs. 7 lbs.

Killed when dying—March 22nd, 1905. [61 days after inoculation].

Clinical Notes.

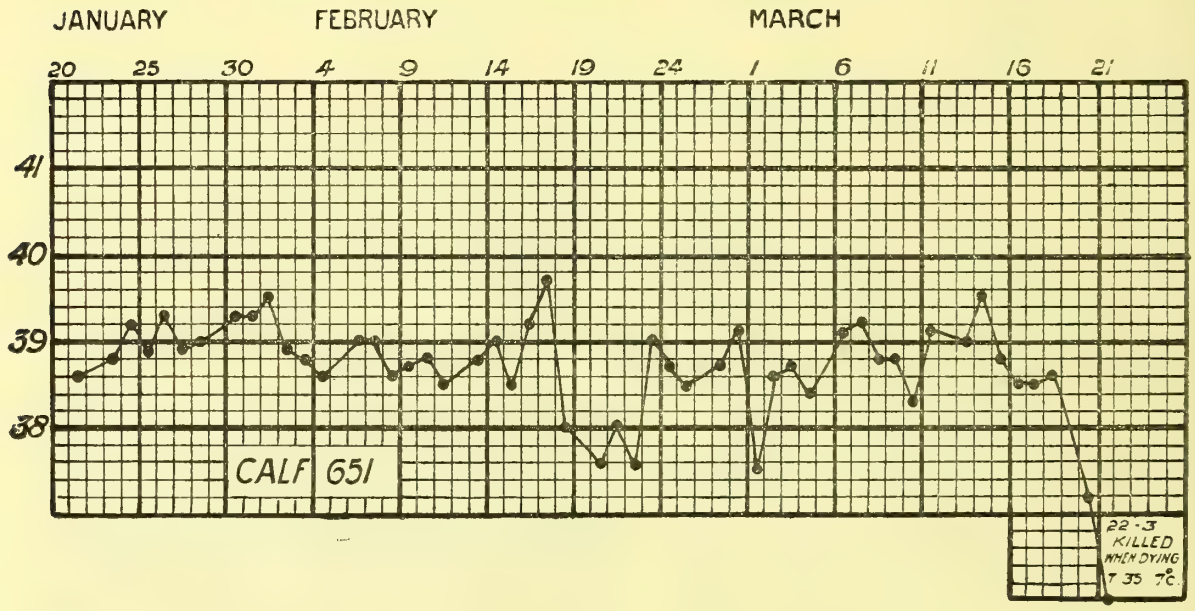
The calf was inoculated on January 20th, 1905. Eleven days later there was a swelling at the seat of inoculation, measuring 5 in. by 4 in. The right prescapular gland was enlarged, the size of a walnut.

On the 25th day the swelling measured 3½ in. by 3 in. and the gland was only slightly enlarged.

On the 59th day the calf, which up to this time had been well, was found lying down and unable to get up, with a sub-normal temperature, and obviously very ill, There were no definite symptoms.

On March 22nd, two days later, the calf was killed when in a dying condition.

Temperature.



Weights.

The calf gained weight during the first 39 days, and then began to lose weight rapidly. (The loss of weight during the remaining 22 days was 25 lbs.)

	cwts.	qrs.	lbs.	
January 20th, 1905 - -	0	3	7	Inoculated
January 31st, 1905 - -	0	3	19	
February 14th, 1905 - -	0	3	26	
February 28th, 1905 - -	1	0	0	
March 14th, 1905 - -	0	3	18	
March 22nd, 1905 - -	0	3	3	Killed.

Total loss of weight during experiment.—4 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Thin.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a hemispherical fluctuating swelling 1¾ in. in diameter, which consisted of semi-solid putty-like caseous matter, slightly more solid peripherally, but without a definite abscess wall.

Right Prescapular Gland.—Was not enlarged, and did not exceed 1¼ in. in length. It contained one caseous and slightly gritty nodule, about the size of a pea.

Left Prescapular Gland.—Normal.

Prepectoral Glands.—Two prepectoral glands on the right side, each about as large as a very small pea, were caseo-calcareous almost throughout. The left prepectoral gland was normal.

Axillary Glands.—Normal.

Thorax.

Pleura.—Normal.

Lungs.—Showed no sign of tubercle. On the external surface of the left lung was a blueish-grey patch, which covered the greater part of the costal surface of the lower lobe, of irregular outline, but sharply defined. It was found to affect the surface only of the lung, extending to a depth of about ⅛ in. The affected part on section was purple in colour, and sank in water. A few small spots of a similar kind were seen elsewhere on the surface of the lung.

Thoracic Glands.—Normal.

Heart.—There were some petechial hæmorrhages on the surface of the heart, along the interventricular sulcus. The heart was otherwise normal, and showed no sign of tubercle.

Abdomen.

Peritoneum, Omentum.—Normal.

Stomach, Intestines.—There was very little food in the stomach and intestines, which were otherwise normal in appearance.

Mesenteric Glands, Spleen, Liver, Hepatic Glands, Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Bladder.—On opening the abdominal cavity, the bladder was found to be greatly distended. There was no obstruction in the urethra. The urine was pale and clear; the bladder was free from inflammation.

Special Glands.

Precrural, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

VIRUS H 41. "A.S."

KNEE JOINT. (Operation)

VIRUS H 41. "A.S."

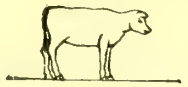
CULTURE INOCULATION.

March 29, 1905.

Strain derived from original material, through Guinea-pig 1435.

Total duration of artificial cultivation : 2½ months.

The 2nd subculture was used for injection, 21 days old, on glycerin-serum.



BULL CALF 699.

Subcutaneous.

Dose : 50 mg.

Killed : June 26, 1905.

89 days.

P.M.—Abscess at seat of inoculation : caseous and softened nodules in nearest glands. (L.T.)

RABBITS.

318	50 mg.	Killed.	89 days.	Slight tuberculosis of peritoneum, lungs and kidneys.
320	10 mg.	„	„ „	
319	1 mg.	„	„ „	Very slight tuberculosis peritonitis. A single small tubercle in one kidney.



BULL-CALF 713.

Subcutaneous

Dose : 50 mg.

Killed : June 26, 1905.

89 days.

P.M.—Abscess at seat of inoculation : caseo-calcareous and softened nodules in nearest glands. (L.T.)

VIRUS H 41. "A.S."

"A.S.," Female, Aged Thirty-Nine, Admitted to Hospital on November 9th, 1904, suffering from Tuberculous Disease of the Right Knee-Joint. Operation on November 11th, 1904.

Family History.—There was no history of tuberculosis in the family.

Clinical History.—The patient was admitted to hospital on November 9th, 1904. Four years previously she had received a blow on the right knee, followed six weeks later by pain and swelling at the joint. She was in bed for a short time, but was afterwards able to walk about.

A year later she was seen by a surgeon, and the limb was put in a back splint, and the patient used crutches. After this on two occasions the joint was injured by falling.

For the next two and a half years the limb was treated by rest, and the patient spent a considerable time in bed. The swelling diminished. The joint was put in a plaster of Paris splint two months before admission to hospital.

The patient's previous health had been good, and beyond the condition of the knee there were no other signs of tubercle to be found on examination.

On November 11th, two days after admission, an operation was performed. The knee joint was completely excised, but the patella was not removed. The ends of the femur and tibia were fixed with ivory pegs. The wound healed by first intention.

On December 18th the patient complained of severe pain on the left side of the chest, and was found to have dry pleurisy at the base of the left lung. The symptoms of pleurisy had subsided when the patient was discharged from hospital on January 5th.

Subsequent History.

The patient was admitted to hospital again in February, 1906. The knee was then quite sound and ankylosed. The patient was suffering on the second admission from frequency of micturition, accompanied by pain. There was no hæmaturia. Microscopical examination of the urine showed a few pus cells. Specimens were centrifugalised on several occasions, and examined microscopically for tubercle bacilli, but always with a negative result. Examination of the bladder with the cystoscope was also negative. The patient was otherwise in good health.

DESCRIPTION OF MATERIAL RECEIVED AT BLYTHWOOD.

The lower end of the femur, the upper end of the tibia, part of the outer condyle, and the synovial membrane.

The articular surfaces of the femur and tibia, with the cartilages and the joints were eroded, and the synovial membrane was pulpy. Little caseous points were found beneath the cartilage.

Microscopical Examination.

An emulsion was made of all the available material, but no tubercle bacilli could be found in it.

CALF 699. (Virus H 41. "A.S.")

Subcutaneous Inoculation of culture derived from human knee-joint through Guinea-pig 1435.

Dose—50 milligrammes.

Date—March 29th, 1905.

Weight at Inoculation—1 cwt. 0 qrs. 2 lbs. (Age about 10 weeks.)

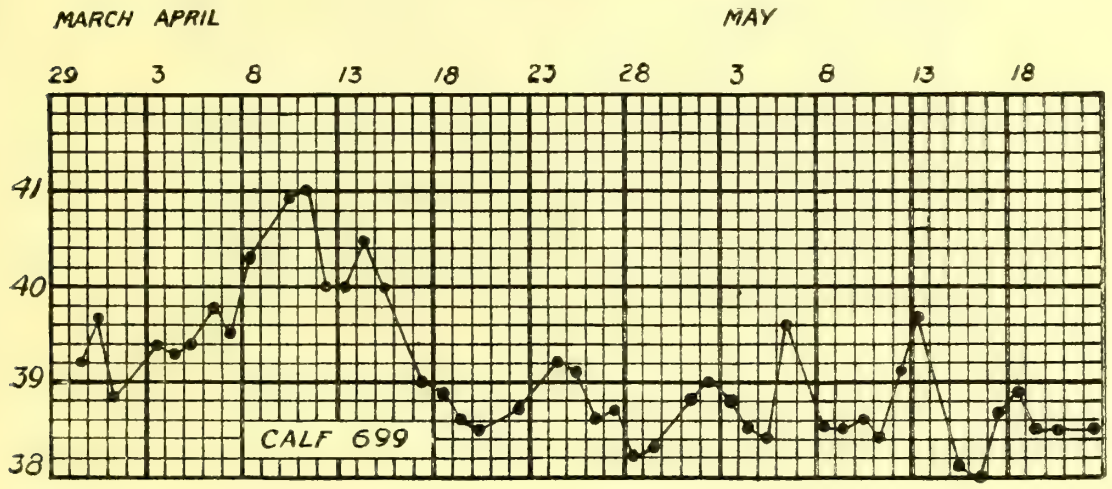
Killed—June 26th, 1905. [89 days after inoculation.]

Clinical Notes.

The calf was inoculated on March 29th, 1905. The development of the tumour at the seat of inoculation and of the right prescapular gland, was similar to that usually seen in calves inoculated with 50 mgs. of culture of a non-virulent virus.

The calf was killed on June 26th, 89 days after inoculation. It had remained well during the whole period of the experiment.

Temperature.



From May 22nd to June 26th, when the calf was killed, the temperature remained normal.

Weights.

The calf gained weight steadily during the period of the experiment.

	cwts.	qrs.	lbs.	
March 29th, 1905	1	0	2	Inoculated.
April 11th, 1905	1	0	10	
April 25th, 1905	1	0	14	
May 9th, 1905	1	0	25	
May 23rd, 1905	1	1	5	
June 6th, 1905	1	1	17	
June 26th, 1905	1	1	27	Killed.

Total gain of weight during experiment.—1 qr. 25 lbs.

Average rate of gain per week.—4·1 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a prominent fluctuating tumour of moderate size, measuring 3 in. by 2¼ in. by 1¼ in. It contained broken down caseous matter in a fibrous capsule.

Right Prescapular Gland.—Was moderately enlarged, and contained a large caseous nodule 1½ in. by 1¼ in. which was commencing to soften, and another smaller nodule ⅓ in. in diameter.

Left Prescapular Gland.—Normal.

Right Prepectoral Gland.—Was enlarged, and measured 1¼ in. by ¾ in. It contained a caseous nodule which was commencing to soften, about ⅝ in. in diameter.

Axillary Glands.—Normal.

Thorax.

Pleura, Lungs, Thoracic Glands, Heart.—Normal.

Abdomen.

Peritoneum, Omentum, Intestines, Mesenteric Glands, Spleen, Liver, Hepatic Glands, Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

CALF 713. (Virus H 41. "A.S.")

Subcutaneous Inoculation of culture derived from human knee-joint, through Guinea-pig 1435.

Dose—50 milligrammes.

Date—March 29th, 1905.

Weight at Inoculation—3 qrs. 21 lbs. (Age about 9 weeks.)

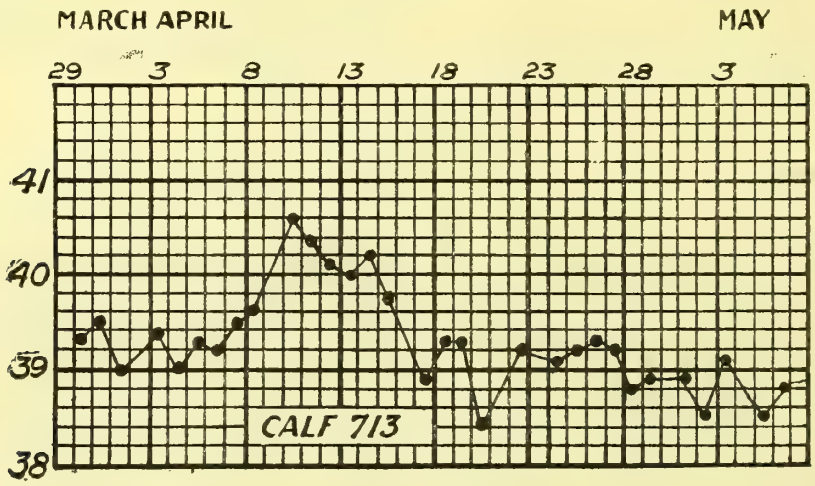
Killed—June 26th, 1905. [89 days after inoculation.]

Clinical Notes.

The calf was inoculated on March 29th, 1905. The development of the tumour at the seat of inoculation, and of the right prescapular gland, was similar to that usually seen in calves inoculated with 50 mgs. of a non-virulent virus.

The calf was killed on June 26th, 89 days after inoculation. It had remained well during the whole period of the experiment.

Temperature.



From May 8th to June 26th, when the calf was killed, the temperature remained normal.

Weights.

The calf gained weight steadily during the experiment.

	cwts.	qrs.	lbs.	
March 29th, 1905 - - -	0	3	21	Inoculated.
April 11th, 1905 - - -	1	0	3	
April 25th, 1905 - - -	1	0	9	
May 9th, 1905 - - -	1	0	17	
May 23rd, 1905 - - -	1	0	26	
June 6th, 1905 - - -	1	1	9	
June 26th, 1905 - - -	1	1	20	Killed.

Total gain of weight during experiment.—1 qr. 27 lbs.

Average rate of gain per week.—4·3 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a fluctuating tumour of moderate size, measuring 4¼ in. by 2½ in. by 1¾ in. It contained broken down caseous matter in a fibrous walled cavity.

Right Prescapular Gland.—Was moderately enlarged, and contained several firm caseous nodules, the peripheral parts of which were calcified and were commencing to soften.

Left Prescapular Gland.—Normal.

Right Prepectoral Gland.—The size of a small cherry, was almost entirely occupied by solid caseous nodules, the peripheral parts of which were calcareous.

Axillary Glands.—Normal.

Thorax.

Pleura, Lungs, Thoracic Glands, Heart.—Normal.

Abdomen.

Peritoneum, Omentum, Intestines, Mesenteric Glands, Spleen.—Normal.

Liver.—In the liver were found two pea-sized nodules, each of which had thick fibrous walls and a small cavity with pultaceous contents, similar to that found in Calf 665 (Virus H. 21 "G.B.") No tubercle bacilli were found in a microscopical preparation, but in it a small parasite, ¼ in. in length, was seen, shaped something like a fluke, and having an elongated neck composed of several segments.

Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal, Submaxillary, Left Parotideal.—Normal.

Right Parotideal Gland.—Contained a suspicious focus. (No tubercle bacilli.)

Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

Microscopical Examination.

Focus from Parotideal Gland.—No tubercle bacilli.

Nodule from Liver.—No tubercle bacilli.

VIRUS H 42. "M.R."

ANKLE-JOINT. (Operation.)

VIRUS H 42. "M.R."

ANKLE JOINT.

CULTURE INOCULATION.

March 30, 1905.

Strain derived from original material through G.P. 1447.

Total duration of artificial cultivation : 3 months.

Culture used for injection : 3rd subculture, 21 days old, on glycerin serum.



BULL-CALF 695.

Subcutaneous.

Dose : 50 mg.

Killed : June 27, 1905.

89 days.

P.M.—Thickened skin and caseous foci at seat of inoculation. Caseo-calcareous nodules in nearest glands. (L.T.)

RABBITS.

321	50 mg.	Killed	89 days	Slight tuberculous peritonitis.
322	10 „	„	„	Very slight do.
323	1 „	„	„	Trace of tuberculous peritonitis only.



BULL-CALF 707.

Subcutaneous.

Dose : 50 mg.

Killed : June 27, 1905.

89 days.

P.M.—Abscess at seat of inoculation. Caseo-calcareous nodules in prescapular gland. (L.T.)

VIRUS H 42. "M.R."

M.R., FEMALE, AGED 64, ADMITTED TO HOSPITAL ON OCTOBER 1st, 1904, SUFFERING FROM TUBERCULOUS DISEASE OF THE LEFT ANKLE JOINT. OPERATION: DECEMBER 2nd, 1904.

Family History.—Unreliable.

Clinical History.—Uncertain. The patient stated that she had suffered from what she supposed to have been rheumatism in her ankle for some months before going to hospital. She could not remember ever having received any definite injury, and could not account in any way for the condition.

The leg was amputated below the knee, and the whole of the portion of the limb removed was sent to Blythwood.

SUBSEQUENT HISTORY.

The patient was visited on September 14th, 1906, about a year and nine months after the operation, and was then found to be in good general health.

DESCRIPTION OF MATERIAL RECEIVED AT BLYTHWOOD.

The lower end of the left tibia and fibula, together with the foot of the same limb.

At the back of the *ankle joint*, and partly behind the internal malleolus, was an old ulcer, with an opening which communicated with a ramifying sinus leading into the ankle joint.

The articular surfaces of *tibia*, *fibula*, and *astragalus* were much eroded, the bone being soft, and easily pierced with a knife. The articular surfaces of the *calcaneo-astragaloid joint* were normal, but the synovial membrane appeared to be a little swollen. The upper surface of the *os calcis*, behind the ankle joint, was eroded.

Microscopical Examination.

Emulsion of scrapings from the joint.—Showed no tubercle bacilli.

Emulsion of scrapings from the sinuses.—Showed no tubercle bacilli.

CALF 695. (Virus H 42. "M.R.")

Subcutaneous Inoculation of culture derived from human ankle joint through Guinea-Pig 1447.

Dose—50 milligrammes.

Date—March 30th, 1905.

Weight at Inoculation—3 qrs. 20 lbs.

Killed—June 27th, 1905. [89 days after inoculation.]

Clinical Notes.

The calf was inoculated on 30th March, 1905.

The development of the tumour at the seat of inoculation, and of the right prescapular gland, was similar to that usually seen in calves inoculated with 50 milligrammes of culture of a virus of Group II.

The calf was killed on June 27th, 89 days after inoculation. It had remained well during the whole period of the experiment.

Temperature.

There was a slight rise of temperature at the commencement of the experiment, which reached 40·0° C. on the 12th day and lasted three weeks. Afterwards the temperature remained normal.

Weights.

The animal increased in weight steadily, though somewhat slowly.

	cwts.	qrs.	lbs.	
March 30th, 1905 - - -	0	3	20	Inoculated.
April 11th, 1905 - - -	1	0	8	
April 25th, 1905 - - -	1	0	13	
May 9th, 1905 - - -	1	0	20	
May 23rd, 1905 - - -	1	0	23	
June 6th, 1905 - - -	1	1	1	
June 27th, 1905 - - -	1	1	6	Killed.

Total gain of weight during experiment.—1 qr. 14 lbs.

Average rate of gain per week.—3·3 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a small puckered prominence surrounding a sinus. Under the thickened skin section revealed a number of softened caseous foci.

Right Prescapular Gland.—Was slightly enlarged, and contained two large caseous and very calcareous nodules.

Left Prescapular Gland.—Normal.

Right Prepectoral Gland.—The size of a small cherry, contained a large caseo-necrotic nodule, only slightly calcareous.

Cervical Glands.—A deep cervical gland on the same side contained a very calcareous nodule.

Axillary Glands.—Normal.

Thorax.

Pleura, Lungs, Thoracic Glands, Heart.—Normal.

Abdomen.

Peritoneum, Omentum.—Normal.

Intestines, Mesenteric Glands, Spleen, Liver, Hepatic Glands, Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

CALF 707. (Virus H 42. "M.R.")

Subcutaneous Inoculation of culture derived from human ankle joint through Guinea-Pig 1447.

Dose—50 milligrammes.

Date—March 30th, 1905.

Weight at Inoculation—1 cwt. 0 qrs. 3 lbs.

Killed—June 27th, 1905. (89 days after inoculation.)

Clinical Notes.

The calf was inoculated on March 30th, 1905.

The development of the tumour at the seat of inoculation and of the neighbouring prescapular gland, was similar to that usually seen in calves inoculated with 50 mgs. of a virus of Group II.

The calf was killed on June 27th, 1905, 89 days after inoculation. It had remained well during the whole period of the experiment.

Temperature.

There was a slight rise of temperature at the commencement of the experiment, which reached 39·8° C. on the 13th day and lasted about three weeks. Afterwards the temperature remained normal.

Weights.

The animal steadily increased in weight during the experiment.

	cwts.	qrs.	lbs.	
March 30th, 1905 - - -	1	0	3	Inoculated.
April 11th, 1905 - - -	1	0	16	
April 25th, 1905 - - -	1	0	26	
May 9th, 1905 - - -	1	1	10	
May 23rd, 1905 - -	1	1	14	
June 6th, 1905 - - -	1	1	25	
June 27th, 1905 - - -	1	2	0	Killed.

Total gain of weight during experiment.—1 qr. 25 lbs.

Average rate of gain per week.—4·1 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a prominent fluctuating tumour, measuring 4½ in. by 2½ in., and containing softened caseous *débris* in a fibrous-walled capsule.

Right Prescapular Gland.—Was moderately enlarged, and contained a large nodule 1½ in. in greatest diameter, caseo-necrotic, peripherally calcareous, and partly softened; also another smaller nodule of similar character.

Left Prescapular Gland, Right Prepectoral Gland, Axillary Glands.—Normal.

Thorax.

Pleura, Lungs, Thoracic Glands, Heart.—Normal.

Abdomen.

Peritoneum, Omentum, Intestines, Mesenteric Glands, Spleen, Liver, Hepatic Glands, Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Poplitcal, Submaxillary, Parotideal, Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

VIRUS H 43. "F.F."

KNEE-JOINT. (Operation.)

TABLE 43.

VIRUS H 43. "F.F."

CULTURE INOCULATION.

April 1st, 1905.

Strain derived from human knee-joint, direct.

Total duration of artificial cultivation : 5 months.

Culture used : 3rd subculture, 17 days old, on glycerin-serum.



COW-CALF 701.

Subcutaneous.

Dose : 50 mg.

Killed, June 29th, 1905

(89 days).

P.M.—Small abscess at seat of inoculation. Two pea-sized caseous nodules in prescapular gland. (L.T.)

RABBITS.

324	50 mg.	Killed	89 days	Tuberculosis of peritoneum and kidneys. Trace in lungs.
326	50 mg.	Died	27 „	Early G.T.
327	10 mg.	„	26 „	Acute tuberculosis peritonitis. Death due (?) to another infection.
325	10 mg.	Killed	89 „	Slight tuberculosis of peritoneum and kidneys. Trace in lungs.
328	1 mg.	„	89 „	Very slight tuberculosis of peritoneum, kidneys and liver.



BULL-CALF 703.

Subcutaneous.

Dose : 50 mg.

Killed, June 29th, 1905

(89 days).

P.M.—Small abscess tumour at seat of inoculation ; caseo-calcareous nodules in nearest glands. (L.T.)

VIRUS H 43. "F.F."

F.F., A Male Child, aged Seven, admitted to Hospital October 21st, 1904, Suffering from Chronic Disease of the Left Knee-joint. Operation: October 28th, 1904.

Family History.—Four other children living; one died at 7 weeks. The child's grandfather and grandmother on the mother's side died of phthisis.

Clinical History.—The disease of the right knee-joint, from which the child suffered, had been diagnosed as tuberculous for a considerable time before admission, and he had been under observation for three years.

October 26th, 1904. The knee was slightly flexed, and gave pain on attempt at movement. The synovial membrane was thickened, especially in the supra-patellar pouch.

October 28th, Operation. Excision of diseased synovial membrane; joint scraped.

The wound took a long time to heal. The boy was discharged well on the 14th December, 1904. He then looked strong and healthy, and there was no other disease.

DESCRIPTION OF MATERIAL RECEIVED AT BLYTHWOOD.

The Pulpy Synovial Membrane, etc., of a Knee-joint, composed of fibrous tissue, both dense and softened, containing several patches of yellow and softened purulent caseous matter and several little solid yellow foci.

An emulsion of portions of the tissues received was made, and on microscopic examination was seen to contain only a very few tubercle bacilli.

CALF 701. (Virus H 43. "F.F.")

Subcutaneous—Inoculation of culture derived from human knee-joint.

Dose—50 milligrammes.

Date—April 1st, 1905.

Weight at Inoculation—3 qrs. 17 lbs.

Killed—June 29th, 1905. [89 days after inoculation.]

Clinical Notes.

The calf was inoculated on April 1st, 1905.

The development of the tumour at the seat of inoculation and of the right prescapular gland, was similar to that usually seen in calves injected with 50 mg. of a virus of human Group II.

The calf was killed on June 29th, 1905, 89 days after inoculation. It had remained well during the entire period of the experiment.

Temperature.

During the first fortnight after inoculation the temperature was irregular, varying between 38·5° and 39·5°. Throughout the remainder of the experiment it was normal.

Weights.

The calf grew but little during the experiment.

	cwts.	qrs.	lbs.	
April 1st, 1905 - - -	0	3	17	Inoculated.
April 25th, 1905 - - -	1	0	5	
May 9th, 1905 - - -	1	0	6	
May 23rd, 1905 - - -	1	0	4	
June 6th, 1905 - - -	1	0	11	
June 29th, 1905 - - -	1	0	15	Killed.

Total gain of weight during experiment.—26 lbs.

Average rate of gain per week.—2 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a prominent fluctuating swelling, which measured 3 in. by 2 in. by 1½ in., and consisted of a fibrous-walled cavity, with softened caseous matter.

Right Prescapular Gland.—Was scarcely at all enlarged. It contained two pea-sized caseous nodules, one calcareous, and the other partly softened.

Left Prescapular Gland, Right Prepectoral Gland, Axillary Glands.—Normal.

Thorax.

Pleura, Lungs, Thoracic Glands, Heart.—Normal.

Abdomen.

Peritoneum, Omentum, Intestines, Mesenteric Glands, Spleen, Liver, Hepatic Glands, Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Mamma, Supramammmary Glands.—Normal.

Special Glands.

Precrural, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

CALF 703. (Virus H 43. "F.F.")

Subcutaneous—Inoculation of culture derived from human knee-joint.

Dose—50 milligrammes.

Date—April 1st, 1905.

Weight at Inoculation—1 cwt. 0 qrs. 2 lbs.

Killed—June 29th, 1905. [89 days after inoculation.]

Clinical Notes.

The calf was inoculated on April 1st, 1905. The development of the tumour at the seat of inoculation and of the right prescapular gland was similar to that usually seen in calves injected with 50 mg. of a virus of human Group II.

The calf was killed on June 29th, 89 days after inoculation. It had remained well during the whole period of the experiment.

Temperature.

The temperature of this animal was very similar to that of its fellow, Calf 701. It was slightly above the normal and rather irregular till the end of April, and was subsequently normal.

Weights.

The gain of weight during the experiment was irregular, and somewhat slow.

	cwts.	qrs.	lbs.	
April 1st, 1905 - - -	1	0	2	Inoculated.
April 11th, 1905 - - -	1	0	14	
April 25th, 1905 - - -	1	0	12	
May 9th, 1905 - - -	1	0	22	
May 23rd, 1905 - - -	1	0	22	
June 6th, 1905 - - -	1	1	3	
June 29th, 1905 - - -	1	1	13	Killed.

Total gain of weight during experiment—1 qr. 11 lbs.

Average rate of gain per week—3 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a small tumour 3 in. by 2 in., in the middle of which was a depressed sinus. This led to an irregular cavity just beneath the skin, which contained within fibrous walls a small amount of softened caseous matter. Some calcareous grains were embedded in the lining of the cavity.

Right Prescapular Gland.—Was moderately enlarged, and contained two caseous and partly calcareous nodules, one of which was $1\frac{1}{4}$ in. in diameter, and was extensively softened.

Left Prescapular Gland.—Normal.

Right Prepectoral Gland.—Was not enlarged, and contained a caseo-calcareous nodule.

Axillary Glands.—Normal.

Thorax.

Pleura, Lungs, Thoracic Glands, Heart.—Normal.

Abdomen.

Peritoneum, Omentum, Intestines, Mesenteric Glands, Spleen, Liver, Hepatic Glands, Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

VIRUS H 44. "D.C."

CERVICAL GLANDS. (Operation.)

TABLE 44.

VIRUS H. 44. "D.C."

CULTURE INOCULATION.

April 7, 1905.

Strain derived from human cervical glands, direct.

Total duration of artificial cultivation, 5 months.

7th culture used for injection, 21 days old, grown on serum and on serum-glycerin.



BULL-CALF 705.

Subcutaneous.

Dose : 50 mg.

Killed, July 6, 1905.

90 days.

P.M.—Ulcerated local tumour. Prescapular gland partly caseo-calcareous. 2 tubercles in one kidney, 3 in one suprarenal. Calcareous foci in many mesenteric glands. (S.T.)

RABBITS.

342	50· mg.	Died	44 days	Tuberculous peritonitis. Very slight tuberculosis of lungs and kidneys.
343	10· mg.	Killed	90 „	Slight tuberculosis of peritoneum, lungs and kidneys.
345	5· mg.	„	90 „	Slight tuberculosis of peritoneum and one kidney. Trace in lungs.
344	1· mg.	„	90 „	Very slight tuberculosis of peritoneum, lungs, and kidneys.
346	1· mg.	„	90 „	Slight tuberculosis of peritoneum. Trace in lungs.



BULL-CALF 731.

Subcutaneous.

Dose : 50 mg.

Killed, July 6, 1905.

90 days.

P.M.—Abscess at seat of inoculation. Caseous nodules in nearest glands. Left bronchial, many mesenteric and cœliac, and many peripheral glands contained one or two tubercles each. (S.T.)

VIRUS H. 44. "D.C."

D.C., A Male Child, Aged Four Years, Admitted to Hospital on October 26th, 1904, Suffering from Enlarged Cervical Glands. Operation, November 7th, 1904.

Family History.—Maternal uncle died of phthisis. One brother died of whooping cough at seven years of age; another died at the age of eighteen months of pneumonia and tuberculosis, following measles.

Clinical History.—The mother stated that the glands in the neck became enlarged about two years previously, following an attack of measles. The child subsequently suffered from erysipelas of the face. No reliable information could be obtained as to the feeding of the child during infancy.

After admission to the hospital an abscess on the right side of the neck, apparently caused by the breaking-down of a gland, was opened and scraped. The wound having quite healed ten days afterwards, a further operation was performed. Two masses of glands, one in the anterior, and the other in the posterior triangle of the neck, were removed. Some of these glands were found to be suppurating.

DESCRIPTION OF MATERIAL RECEIVED AT BLYTHWOOD.

A Bunch of Cervical Lymphatic Glands, the largest about $\frac{3}{4}$ in. in length. Several glands showed on section a large creamy-white caseous nodule, more or less softened.

These glands were made into an emulsion, which on microscopical examination was found to contain a few tubercle bacilli.

Subsequent History.

The patient was visited on January 27th, 1906, about fourteen months after the operation. He was then found to be a healthy-looking, well-nourished boy. There were scars on both sides of the neck, but no glands could be felt in the cervical region. The sternum was very prominent, and there was marked flattening of the ribs in front of both sides. No signs of disease could be detected.

CALF 705. (Virus H 44. "D.C.")

Subcutaneous—Inoculation of culture derived from human cervical glands.

Dose—50 milligrammes.

Date—April 7th, 1905.

Weight at Inoculation—1 cwt. 0 qrs. 3 lbs.

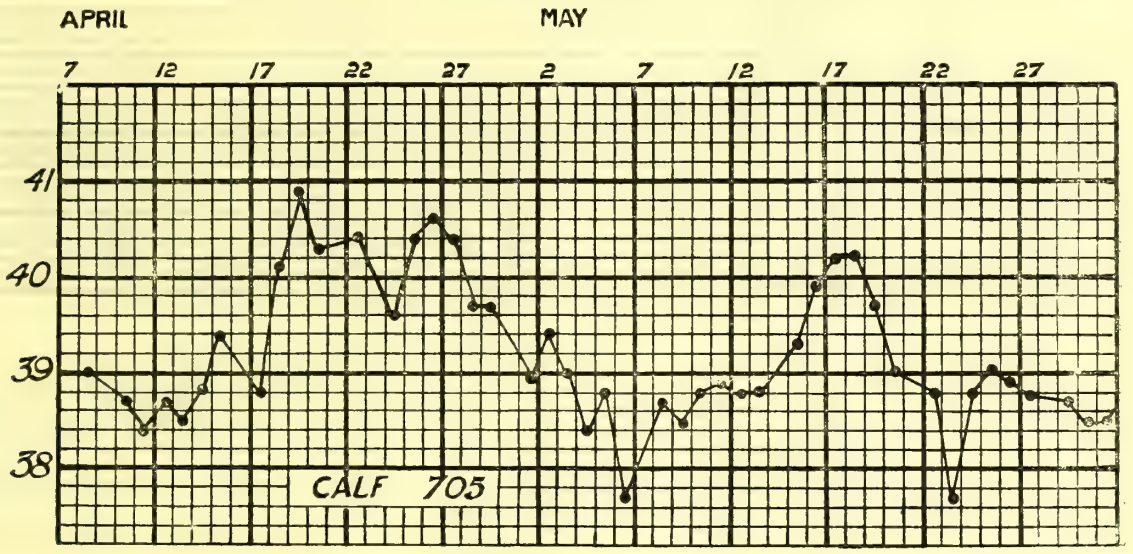
Killed—July 6th, 1905. [90 days after inoculation.]

Clinical Notes.

The calf was inoculated on April 7th, 1905. The development of the tumour at the seat of inoculation, and of the neighbouring lymphatic gland, was similar to that usually seen in calves inoculated with 50 mgs. of a virus of Group II.

The calf was killed on July 6th, 90 days after inoculation. The constitutional disturbance immediately following the inoculation accompanied by a rise of temperature, which is frequently seen in similar cases, was rather severe in this animal. It was quite well, however, when killed.

Temperature.



After June 1st, the temperature remained normal.

Weights.

The calf grew but slowly during the experiment.

	cwts.	qrs.	lbs.	
April 7th, 1905 - - -	1	0	3	Inoculated.
July 6th, 1905 - - -	1	1	2	Killed.

Total gain of weight during the experiment.—27 lbs.

Average rate of gain per week.—2 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—At the seat of inoculation on the right side of the neck was a tumour measuring 3½ in. by 2 in., which had ulcerated through the skin. The opening led to a sinus surrounded by dense fibrous tissue and contained pus-like contents.

Right Prescapular Gland.—Was moderately enlarged. The cortex, brownish and soft, was everywhere infiltrated with caseo-calcareous striæ.

Left Prescapular Gland.—Normal.

Right Prepectoral Gland.—Normal.

Axillary Glands.—Normal.

Thorax.

Pleura.—Normal.

Lungs.—The right anterior lobe, part of the left, and many small areas elsewhere were consolidated (carnified) and the bronchi of the affected parts were dilated and filled with muco-pus.

Thoracic Glands, Heart.—Normal.

Abdomen.

Peritoneum, Omentum, Intestines.—Normal.

Mesenteric Glands.—Many contained groups of minute calcareous foci in a somewhat condensed cortex. The change was rather diffuse (unlike that in the fellow calf) and it was very little advanced; the affected glands exuded milky juice like normal glands.

Spleen, Liver, Hepatic Glands.—Normal.

Kidneys.—Right contained two small tubercles (two tubercle bacilli were seen). Left normal.

Suprarenals.—Left contained three small tubercles. Right normal.

Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

Microscopical Examination.

Mesenteric Gland, calcareous focus from.—Tubercle bacilli.

Kidney, tubercle from.—Few tubercle bacilli (two seen).

Suprarenal, tubercle from.—Tubercle bacilli.

CALF 731. (Virus H 44. "D.C.")

Subcutaneous—Inoculation of culture derived from human cervical glands.

Dose—50 milligrammes.

Date—April 7th, 1905.

Weight at Inoculation—3 qrs. 19 lbs.

Killed—July 6th, 1905. [90 days after inoculation].

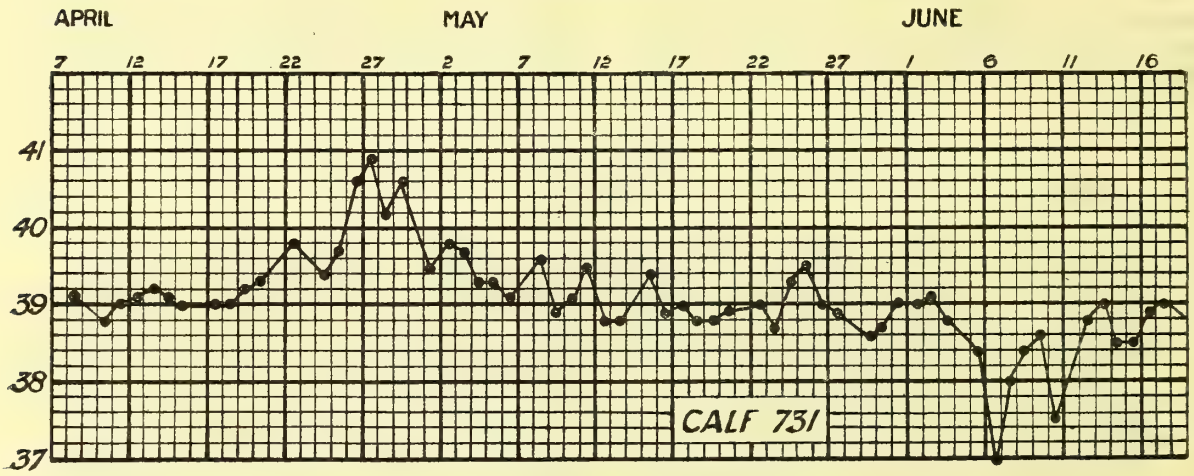
Clinical Notes.

The calf was inoculated on April 7th, 1905. The development of the tumour at the seat of inoculation, and of the neighbouring lymphatic gland, was similar to that usually seen in calves inoculated with 50 mg. of a virus of human Group II.

The calf was killed on July 6th, 90 days after inoculation.

The constitutional disturbance immediately following the inoculation, accompanied by a rise of temperature, which is frequently seen in similar cases, was very severe in this animal. It grew very little, and seemed thin when killed, though otherwise well.

Temperature.



From June 16th till the death of the animal the temperature was fairly normal.

Weights.

The calf gained very little in weight during the experiment.

	cwts.	qrs.	lbs.	
April 7th, 1905 - - -	0	3	19	Inoculated.
July 6th, 1905 - - -	1	0	3	Killed.

Total gain of weight during experiment.—12 lbs.

Average rate of gain per week.—0·9 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Very thin.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a sausage-shaped tumour, 4 in. by $1\frac{3}{4}$ in. by $1\frac{1}{2}$ in., not infiltrating skin or muscle.

It consisted of a fibrous capsule, with softened caseous contents.

Right Prescapular Gland.—Was slightly enlarged, and contained a large softened caseous nodule 1 in. in longest diameter.

Left Prescapular Gland.—Normal.

Right Prepectoral Gland.—Was large as a pea, contained a softened nodule.

Axillary Glands.—Normal.

Cervical Glands.—One right deep cervical gland was enlarged, and contained a softened caseous nodule.

Thorax.

Pleura, Lungs.—Normal.

Thoracic Glands.—Left bronchial contained two little tubercles. Others normal.

Heart.—Normal.

Abdomen.

Peritoneum, Omentum.—Normal.

Intestines.—Showed several softened yellow points (2 tubercle bacilli seen in a film from one of these).

Mesenteric Glands.—Many glands contained one or two tuberculous foci varying in size from a calcareous grain to a little softened caseous nodule as large as a small shot.

Spleen, Liver, Hepatic Glands, Kidneys, Suprarenals, Renal Glands.—Normal.

Coeliac Glands.—The coeliac glands were similar to the mesenteric.

Lumbar Glands.—Normal.

Iliac Glands.—A group of very small tubercles in left. Right normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural.—One small tubercle in left, one larger in right.

Pubic.—Normal.

Gluteal.—Right contained one tubercle. Left normal.

Ischiatic—Normal.

Popliteal.—One small tubercle in left, two in right.

Left Submaxillary.—Normal.

Right Submaxillary.—Contained a single tubercle.

Parotideal, Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

Microscopical Examination.

Mesenteric Gland, tubercle from.—Tubercle bacilli (four seen).

Small Intestine, focus from.—Tubercle bacilli (two seen).

Bronchial Gland, tubercle from.—One tubercle bacillus seen.

Precrural Gland, focus from.—No tubercle bacilli seen.

VIRUS H 45. "F.M."

BRONCHIAL GLANDS. (Post-mortem.)

TABLE 45.

VIRUS H 45. "F.M."

BRONCHIAL GLANDS.

CULTURE INOCULATION.

April 19, 1905.

Strain derived from human bronchial glands, through G.P. 1137.

Total duration of artificial cultivation : 11 months.

Culture used for injection : 8th subculture, 21 days old, grown on pure serum and on glycerin serum.



COW-CALF 741.

Subcutaneous.

DOSE : 275 milligrammes.

Killed July 18, 1905.
90 days.

P.M.—Small tumours only at each of the three seats of inoculation. Caseo calcareous nodules in the adjoining glands. [L.T.]



BULL-CALF 763.

Subcutaneous.

DOSE : 50 milligrammes.

Killed July 18, 1905.
90 days.

P.M.—Small abscess at seat of inoculation. Caseo calcareous nodules in prescapular gland. Four foci in lungs, one in liver, four in mesenteric glands. [S.T.]

RABBITS.

368	50 mg.	Killed	90 days	Very slight tuberculosis of peritoneum and lungs.
369	10 „	„	„ „	Slight tuberculosis of peritoneum and lungs. Trace in kidneys.
370	1 „	„	„ „	Very slight tuberculosis of peritoneum and kidneys.



BULL-CALF 769.

Subcutaneous.

DOSE : 50 milligrammes.

Died May 6, 1905.
17 days.

P.M.—Inflammatory patch at seat of inoculation. Tubercle bacilli found in nearest glands, and in posterior-thoracic gland. Death due to collapse following diarrhœa.

VIRUS H 45. "F.M."

F.M., a Female Child aged One Year, admitted to Hospital on January 5th, 1904. Died on March 18th, 1904.

Family History.—No family history could be obtained.

Clinical History.—The child was admitted, suffering from an ulcer on the heel. A few days afterwards she suffered from measles, and subsequently developed pneumonia, which was suspected to be tuberculous. About a month after the onset of measles the temperature rose to 103°, and continued to vary between that point and the normal until death. Beyond the temperature, the child showed no other clinical signs of tubercle, and throughout her illness there was nothing to lead to any suspicion of abdominal tuberculosis.

She died on March 18th, about two and a half months after admission.

POST-MORTEM EXAMINATION.

No scars in the neck or elsewhere.

Thorax.

Lungs.—Left lung apparently normal. Right lung not dissected.

Bronchial Glands.—Enlarged and caseating.

Abdomen.

Peritoneum.—Showed nothing abnormal.

Intestines.—Showed nothing abnormal.

Mesenteric Glands.—Enlarged and white, apparently caseating.

Liver.—Normal.

Kidneys.—Normal.

Spleen.—Apparently normal, but not examined at post-mortem.

Meninges of Brain.—The cranium was not opened.

Bones.—Healthy.

Joints.—Healthy.

DESCRIPTION OF MATERIAL RECEIVED AT BLYTHWOOD.

Right Lung.—The lower and middle lobes were consolidated. On section they were pinkish-grey in colour and showed irregular areas of caseation. There were small cavities also towards the base of the lower lobe, and a large multilocular cavity, lined with whitish shreds, and filled with dirty-looking purulent fluid. The upper lobe, which contained air, was rather thickly filled with little irregular yellowish foci.

The Bronchial Glands were enlarged and their cortices were almost entirely caseous.

The Mesenteric Glands were enlarged and more or less filled with caseating nodules.

(Comparing the bronchial with the mesenteric glands, the former appeared to be the more severely affected.)

The Spleen showed on the surface several flat tubercles which did not penetrate the capsule.

On section several tubercles with opaque centres and more translucent margins could be seen.

Microscopical Examination.

Emulsion of Bronchial Glands.—Tubercle bacilli, very scanty.

Emulsion of Mesenteric Glands.—No tubercle bacilli seen.

CALF 741. (Virus H 45. "F.M.")

Subcutaneous Inoculation of culture derived from human bronchial glands through Guinea-Pig 1137.

Dose—275 milligrammes. (Approximately 90 milligrammes at each of three seats of inoculation.)

Date—April 19th, 1905.

Weight at Inoculation—3 qrs.

Killed—July 18th, 1905. [90 days after inoculation.]

Clinical Notes.

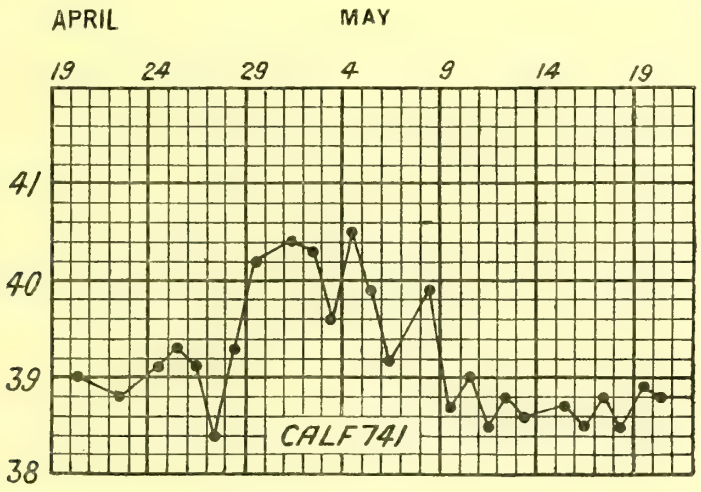
The calf was inoculated in three places on April 19th, 1905.

The development of the tumours at the seats of inoculation, and of the neighbouring prescapular and precrural glands, was similar in each case to that usually seen in calves inoculated with 50 milligrammes of a virus of human Group II.

The calf was killed on July 18th, 1905, 90 days after inoculation.

There was the usual slight constitutional disturbance at the commencement of the experiment; otherwise the calf remained well.

Temperature



From May 19th to July 18th, when the calf was killed, the temperature was normal.

Weights.

During the first three weeks the weight remained stationary; afterwards it steadily increased.

	cwt.	qrs.	lbs.	
April 19th, 1905	0	3	0	Inoculated.
May 9th, 1905	0	3	1	
May 23rd, 1905	0	3	10	
June 6th, 1905	0	3	24	
June 20th, 1905	1	0	2	
July 18th, 1905	1	0	11	Killed.

Total gain of weight during experiment.—1 qr. 11 lbs.

Average rate of gain per week.—3 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Seat of Inoculation.—At each seat of inoculation was a small and prominent swelling. That in the fold of the right thigh had ulcerated and contained a sinus. This swelling was the smallest of the three, the other two being egg-shaped, and measuring two inches in longest diameter. These latter consisted of a fibrous wall enclosing thick caseous, pus-like material. The one which had ulcerated consisted of dense fibrous tissue infiltrated with calcareous grains, surrounded a small sinus.

Right Prescapular Gland.—Was scarcely at all enlarged, and contained a small caseo-calcareous nodule.

Right and Left Precrural Glands.—Were only very slightly enlarged, and were similar to the right prescapular.

Left Prescapular Gland.—Normal.

Right Prepectoral Gland.—Normal.

Axillary Glands.—Normal.

Thorax.

Pleura, Lungs, Thoracic Glands, Heart.—Normal.

Abdomen.

Peritoneum, Omentum, Intestines, Mesenteric Glands, Spleen, Liver, Hepatic Glands, Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Mamma, Supramammary Glands.—Normal.

Special Glands.

Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Pharyngeal, Hyoid.—Normal.

Tongue, Pharynx, Palate, Tonsils.—Normal.

CALF 763. (Virus H 45. "F.M.")

Subcutaneous Inoculation of culture derived from human bronchial glands through Guinea-Pig 1137.

Dose—50 milligrammes.

Date—April 19th, 1905.

Weight at Inoculation—1 cwt. 0 qrs. 3 lbs.

Killed—July 18th, 1905. [90 days after inoculation.]

Clinical Notes.

The calf was inoculated on April 19th, 1905. The development of the tumour at the seat of inoculation, and of the neighbouring prescapular gland, was similar to that usually seen in calves inoculated with 50 milligrammes of a virus of Group II.

It was killed on July 18th, 90 days after inoculation. There was a slight constitutional disturbance following the inoculation, accompanied by loss of weight. There was a slight rise of temperature, which soon subsided, and the calf was quite well for several weeks before it was killed.

Temperature.

There was a very slight rise at the commencement of the experiment, reaching its maximum (39·5° C.) 12 days after inoculation. A month after inoculation the temperature had regained the normal. It remained normal during the remaining period of the experiment.

Weights.

During the first 5 weeks the animal lost weight (7 lbs. in all). After this it gained weight, but not rapidly.

	cwts.	qrs.	lbs.	
April 19th, 1905 - - -	1	0	3	Inoculated.
May 9th, 1905 - - -	0	3	26	
May 23rd, 1905 - - -	0	3	24	
June 6th, 1905 - - -	1	0	14	
June 20th, 1905 - - -	1	0	17	
July 18th, 1905 - - -	1	0	26	Killed.

Total gain of weight during experiment.—23 lbs.

Average rate of gain per week.—1·8 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a small prominent fluctuating tumour 2 in. in diameter, consisting of a fibrous wall, with softened caseous contents.

Right Prescapular Gland.—Was slightly enlarged, and contained several caseo-calcareous nodules.

Left Prescapular Gland, Right Prepectoral Glands, Axillary Glands.—Normal.

Thorax.

Pleura.—Normal.

Lungs.—In the right anterior lobe were three minute translucent grey foci, with a slight central opacity. When crushed they were found to be slightly gritty. A fourth was found in the posterior lobe of the same lung.

Thoracic Glands, Heart.—Normal.

Abdomen.

Peritoneum, Omentum, Intestines.—Normal.

Mesenteric Glands.—Four small caseous foci were found in these glands.

Spleen.—Normal.

Liver.—A single focus, similar to those in the lung, was found in the liver.

Hepatic Glands, Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal, Submaxillary, Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

Microscopical Examination.

Tubercle from Lung.—Tubercle bacilli. (Three were seen.)

Tubercle from Mesenteric Gland.—No tubercle bacilli seen.

CALF 769. (Virus H 45. "F.M.")

Subcutaneous Inoculation of culture derived from human bronchial glands through Guinea-Pig 1137.

Dose—50 milligrammes.

Date—April 19th, 1905.

Weight at Inoculation—1 cwt. 0 qrs. 5 lbs.

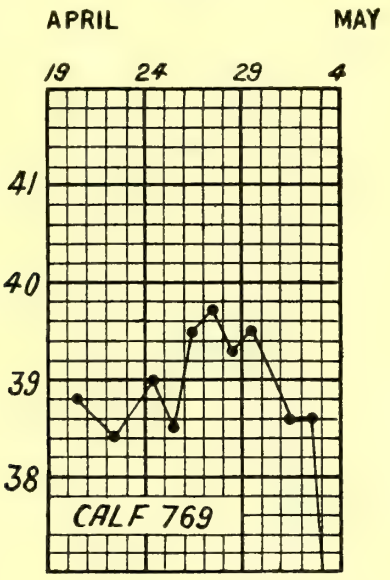
Died—May 6th, 1905. [17 days after inoculation.]

Clinical Notes.

The calf was inoculated on April 19th, 1905. It suffered from diarrhœa, and became very thin. About the beginning of May the eyes were sunken and the animal very ill.

On May 5th red blood-stained discharge was seen issuing from the rectum. An intravenous injection of 2¼ litres of salt solution and 40 cc. of alcohol was given when the calf was in a dying condition. Pulse and condition improved for a time, but the calf was found dead on May 6th, 17 days after inoculation.

Temperature.



Weights.

	cwts.	qrs.	lbs.	
April 19th, 1905 - - -	1	0	5	Inoculated.
April 25th, 1905 - - -	1	0	2	
May 6th, 1905 - - -	0	3	10	Died.

Total loss of weight.—23 lbs.

POST-MORTEM EXAMINATION.

General Condition.—Very thin.

Seat of Inoculation.—At the seat of inoculation, on the right side of the neck, was a patch, 2½ in. by 2 in., composed of imflammatory tissue, soft and commencing to break down.

Right Prescapular Gland, Right Prepectoral Gland.—Were slightly swollen, but showed no sign of tubercle.

Thoracic Glands.—Showed no sign of tubercle.

Lungs.—Several dark points were seen, one of which only had a minute opaque centre. Of the rest, two, reddish and slightly raised, were situated on the visceral pleura. The lungs showed superficial congestion about their bases.

Pleura, Heart; Omentum, Peritoneum, Liver, Hepatic Glands, Spleen, Kidneys, Suprarenals; Tongue, Pharynx, Palate, Tonsils; Pharyngeal, Submaxillary, Hyoid and Parotideal Lymphatic Glands.—Normal.

Intestines.—The lower part of the small intestine, and the large intestine, were greatly congested, and showed patches of bright red colour.

Mesenteric Glands.—Normal.

Testes.—Normal.

Various Lymphatic Glands.

Left Prescapular, Axillary, Precrural, Popliteal, Gluteal, Ischiatic, Renal, Lumbar, Iliac, Pubic.—Normal.

Microscopic Examination.

Yellow Speck from Intestine.—No tubercle bacilli.

Grey Firm Specks from Lung (four films examined).—No tubercle bacilli.

Scraping from Prescapular Gland.—Tubercle bacilli fairly numerous.

Scraping from Prepectoral Gland.—Tubercle bacilli fairly numerous.

Scraping from Long Thoracic Gland.—Tubercle bacilli scanty.

NOTE.—Calf 769 is referred to, and the post-mortem notes are also given in Dr. Cobbett's Report on the "Distribution of non-virulent tubercle bacilli in the body of the calf after subcutaneous injection." (*See* Appendix, Vol. III.)

VIRUS H. 46. "H.W."

KNEE-JOINT. (Operation.)

VIRUS H 46. "H. W."

KNEE-JOINT.

CULTURE INOCULATION.

April 28, 1905.

Strain derived from human tissues through Guinea-pig 1444.
Total duration of artificial cultivation 3½ months.
The 5th subculture was used for injection, 21 days old, on pure serum.



BULL-CALF 767

Subcutaneous.

Dose : 50 mg.

Killed*: May 23, 1905.

25 days.

P.M.—Caseo-necrotic tumour at seat of inoculation. Nearest glands enlarged and tuberculous. Some minute translucent tubercles in lungs.

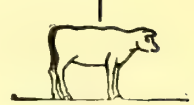
GUINEA-PIGS.

Liver.	1544	Killed	49 days	G.T.
	1545	„	„	„
Spleen.	1546	„	„	„
	1547	„	„	„
Lung.	1548	„	„	„
	1549	„	„	„
Rib Marrow	1550	„	„	Tuberculosis of omental gland only.
	1551	„	„	G.T.

RABBITS.

374	50 mg.	Killed	90 days	Very slight tuberculosis of peritoneum and lungs. Trace in left kidney.
375	10.	„	„	Very slight tuberculosis of peritoneum and kidneys. Trace in lungs.
376	1.	„	„	Very slight tuberculosis of peritoneum, kidneys and lungs. Chronic tuberculosis of uterus.

* Killed in order to find out the distribution of the T.B. at this stage of the disease. *See* Report on Distribution of non-Virulent Tubercle Bacilli, Vol. III.



BULL-CALF 777.

Subcutaneous.

Dose : 50 mg.

Killed : July 27, 1905.

90 days.

P.M.—Abscess at seat of inoculation. Calcareous nodules in prescapular gland. Minute foci in a few mesenteric glands. (S.T.)

GUINEA-PIGS.

Lung.	1619	Killed	42 days	G.T.
	1620	„	„	„
Spleen.	1621	„	„	No tuberculosis.
	1622	„	„	„
Liver.	1623	„	„	„
	1624	„	„	„
Rib Marrow.	1625	„	„	„

VIRUS H 46. "H.W."

"H.W.," Male, Aged Thirty, Admitted to Hospital Suffering from Tuberculous Disease of the Right Knee. Operation on November 30th, 1904.

Family History.—Father worked in a mine for thirty years and was said to have "miner's disease," but remained well for years after giving up this occupation. He eventually died from "hæmorrhage of the lungs."

Clinical History.—The patient appeared to have enjoyed good health. Twelve years before admission he strained the right knee joint. Four years later the knee began to swell. Three years before admission he received another injury, the condition of the joint became much worse, and the patient was obliged to use crutches.

The patient stated that during the last three years his weight had been reduced from 13 to 11 stone.

On October 28th, 1904, the joint was opened, scraped, and washed out. The result of this operation was not satisfactory, and a month later the joint was excised. The wound healed slowly, and was not quite sound when the patient was discharged more than four months after the second operation.

In February, 1906, the patient reported that he was extremely well in general health, could walk without crutches, and then weighed 14½ stone. The wound in the knee, however, was not yet entirely healed.

In November, 1906, stated that the wound had been healed for about six months, and that his general health was very good.

DESCRIPTION OF MATERIAL RECEIVED AT BLYTHWOOD.

The patella, removed at the operation, and some of the synovial membrane, were received at Blythwood.

Patella.—The cartilages were worn away and the bone much eroded, especially above at the margin of the cartilage, where it was to some extent honeycombed. The cavities in the bone and cartilages were filled with caseous material.

Synovial Membrane.—The surface of the synovial membrane was brownish in colour, and somewhat soft and gelatinous in tissue.

Microscopical Examination.

No tubercle bacilli were found on microscopical examination of the caseous material.

CALF 767. (Virus H 46. "H.W.")

Subcutaneous Inoculation of culture derived from human knee joint through Guinea-pig 1444.

Dose—50 milligrammes.

Date—April 28th, 1905.

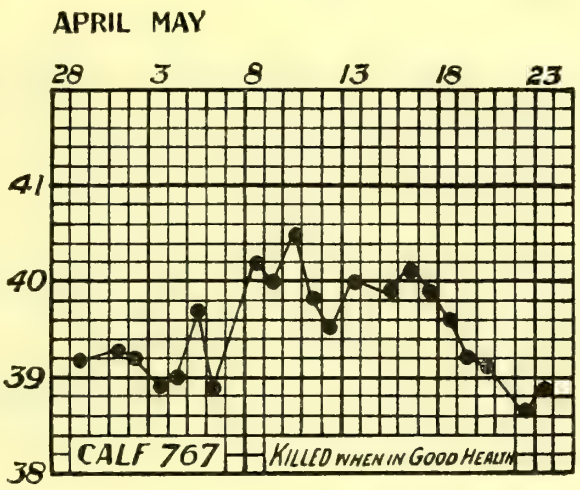
Weight at Inoculation—1 cwt. 0 qrs. 15 lbs. (Age about 12 weeks.)

Killed—May 23rd, 1905. [25 days after inoculation.]

Clinical Notes.

The calf was inoculated on April 28th, 1905. The temperature rose on the 10th day after inoculation, and a large local lesion and prescapular gland developed. The animal was killed on May 23rd, 25 days after inoculation. The temperature had then regained the normal, and the animal was quite well.

Temperature.



Weights.

	cwts.	qrs.	lbs.	
April 28th, 1905 - - -	1	0	15	Inoculated.
May 9th, 1905 - - -	1	0	12	
May 23rd, 1905 - - -	1	0	18	Killed.

Total gain of weight during experiment.—3 lbs.

Tuberculin Test.

The calf was not tested subsequent to themo.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Seat of Inoculation.—The tumour at the seat of inoculation, on the right side of the neck, was large, flat, and fluctuating. It measured 6 in. by 3½ in. It was closely attached to the subjacent muscle, and slightly infiltrated the skin.

On section it was composed of caseo-necrotic tissue, and had a large ragged cavity in its centre, full of caseous flakes suspended in a serous fluid.

Right Prescapular Gland.—Measured 3 in. by 1½ in. by 1¾ in. It was firm and elastic, and consisted partly of translucent grey tissue, and partly of a caseating network. Its capsule was much thickened, and it was very adherent to the surrounding tissues.

Right Prepectoral Gland.—The size of a large pea, was firmer than normal, and in part of its cortex numerous yellow points could be faintly seen.

Left Prescapular and Axillary Glands.—Normal.

Thorax.

Pleura.—Normal.

Thoracic Glands.—Normal.

Lungs.—On the surface of the lungs rather numerous minute grey translucent points could be seen. Some of these had a reddish tinge, and it was difficult to distinguish them from the minute hæmorrhages, which are of frequent occurrence. Some were undoubtedly tubercles, of the kind frequently found in these cases, for they could be picked out on the point of a knife. Scarcely any trace of opacity could be seen in the centres of any of them, and when crushed they did not break under the knife.

Heart.—Normal.

Abdomen.

Omentum, Peritoneum.—Normal.

Liver.—One or two pale specks on the surface was the nearest suggestion of tubercles that could be seen.

Hepatic Glands, Spleen.—Normal.

Kidneys.—A pale speck, similar to those seen in the liver, was seen in each kidney.

Suprarenals.—Normal.

Alimentary Tract.

Tongue, Pharynx, Palate, Tonsils, Pharyngeal Glands, Submaxillary Glands, Hyoid Glands, Parotideal Glands, Intestines, Mesenteric Glands.—Normal.

Eyes.—Normal.

Testes.—Normal.

Various Lymphatic Glands.

Precrural, Popliteal, Gluteal, Ischiatic, Renal, Lumbar, Iliac, Pubic.—Normal.

Microscopical Examination.

Focus from Lung.—No tubercle bacilli.

CALF 777. (Virus H 46. "H.W.")

Subcutaneous Inoculation of culture derived from human knee joint through Guinea-pig 1444.

Dose—50 milligrammes.

Date—April 28th, 1905.

Weight at Inoculation—1 cwt. 0 qr. 4 lbs. (Age about 10 weeks.)

Killed—July 27th, 1905. [90 days after inoculation.]

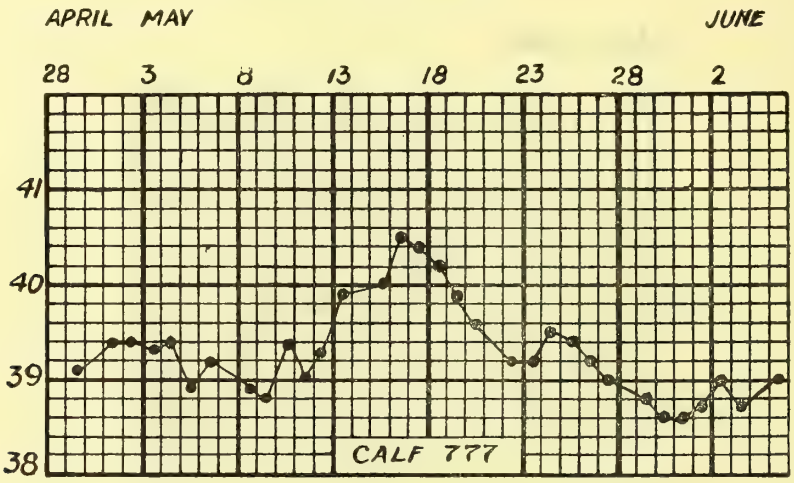
Clinical Notes.

The calf was inoculated on April 28th, 1905. The development of the tumour at the seat of inoculation, and of the prescapular gland, was similar to that usually seen in calves inoculated with 50 mg. of a virus of Group II.

The calf was killed on July 27th, 1905, 90 days after inoculation.

It suffered from the usual constitutional disturbance immediately following the inoculation, and lost weight. It was, however, in good health when killed.

Temperature.



From the beginning of June to July 27th, when the calf was killed, the temperature remained normal.

Weights.

The calf lost weight during the first two months, and gained weight but slowly during the remaining period of the experiment.

	cwts.	qrs.	lbs.	
April 28th, 1905 - - -	1	0	4	Inoculated.
May 9th, 1905 - - -	1	0	3	
May 23rd, 1905 - - -	1	0	2	
June 6th, 1905 - - -	1	0	2	
June 20th, 1905 - - -	0	3	27	
July 27th, 1905 - - -	1	0	6	Killed.

Total gain of weight during experiment.—2 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a prominent fluctuating swelling measuring 4 in. by 2½ in. by 2 in., and weighed 6½ ozs. It consisted of a fibrous-walled cavity, containing softened caseous débris. There had been no external discharge.

Right Prescapular Gland.—Was moderately enlarged, and contained two large fibro-calcareous nodules, the larger of which was already considerably softened.

Left Prescapular Gland.—Normal.

Right Prepectoral Gland.—Not enlarged; was normal on section.

Axillary Glands.—Normal.

Thorax.

Pleura.—Normal.

Lungs.—The lungs showed several small areas of collapse, but were otherwise normal.

Thoracic Glands.—Were not enlarged, and were normal in structure.

Heart.—Normal.

Abdomen.

Peritoneum, Omentum.—Normal.

Mesenteric Glands.—The hooked mesenteric gland, which lies at the angle of the mesentery, contained many minute points visible throughout its capsule. These, when picked out on the point of a knife and crushed between coverslips, were found to be slightly gritty. A few neighbouring glands also had some of these foci.

Small Intestine.—In the small intestine, about 1½ yards from the iliac-cæcal valve, the part corresponding with the gland most affected, were seen a small number of whitish spots, quite superficial and easily scraped off with a knife, unlike tubercles as usually seen.

Large Intestine.—Normal.

Spleen, Liver, Hepatic Glands, Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Testes.

Special Glands.

Precrural, Pubic.—Normal.

Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

Microscopical Examination.

Foci from Mesenteric Gland.—Tubercle bacilli.

Foci from Small Intestine.—No tubercle bacilli.

VIRUS H 47. "S.B."

TUBERCULOUS HIP-JOINT. (Operation.)

VIRUS H 47. "S.B."

HIP-JOINT.

CULTURE INOCULATION.

May 22, 1905.

Strain derived from human tissues through Guinea-Pig 1430.

Total duration of artificial cultivation : 4½ months.

Culture used for injection : 4th subculture, 21 days old, on pure serum.



BULL-CALF 791.

Subcut.

Dose : 50 mg.

Killed, August 19, 1905.

89 days.

P.M.—Thin walled cavity with softened contents at seat of inoculation. Small calcareous nodule in prescapular gland.. (L.T.)

RABBITS.

415	50 mg.	Died	57 days	Slight tuberculosis of peritoneum and one kidney. Cause of death not determined.
416	10 „	Killed	89 „	Slight tuberculosis of peritoneum and lungs.
417	1 „	„	„ „	Very slight tuberculous peritonitis ; trace in lungs.

RATS.

37	100 mg.	Died	113 days	G.T.
38	100 „	Died	160 „	G.T.



BULL-CALF 803.

Subcut.

Dose : 50 mg.

Killed : August 19, 1905.

89 days.

P.M.—Ulcerated local tumour with fibrous walls. Caseo-calcareous nodules in prescapular gland. Several minute calcareous tubercles in lungs. Calcareous grains in almost all mesenteric glands. (S.T.)

VIRUS H 47. "S.B."

S. B., a Female Child, aged Six and a half Years, admitted to Hospital on November 8th, 1904, suffering from Tuberculous Disease of the Right Hip-Joint. Operation: November 11th, 1904.

Family History.—There was no family history of tubercle. One sister died in infancy, apparently from rickets.

Clinical History.—No reliable facts could be obtained as to any previous illnesses or the onset of the present disease.

At the operation the hip joint was found to be almost entirely disorganised by tuberculous disease, both the head of the femur and the acetabulum being involved, and the joint contained a considerable amount of pus. The diseased tissue was removed, and portions of it sent to Blythwood, with some of the pus contained in the joint.

Subsequent History.—The child was visited ten months after the operation. She was still kept in a recumbent position, with the limb in splints, but apparently the disease had not spread.

DESCRIPTION OF MATERIAL RECEIVED AT BLYTHWOOD.

Some fragments of bone, with small quantities of muco-pus adherent to them, and about 10 c.c. of thick pus.

On microscopical examination tubercle bacilli, short and curved, were seen in the pus, but none could be found in an emulsion made from the fragments of bone.

CALF 791. (Virus H 47. "S.B.").

Subcutaneous Inoculation of culture derived from human tissues through Guinea-Pig 1430.

Dose—50 milligrammes.

Date—May 22nd, 1905.

Weight at Inoculation—1 cwt. 0 qrs. 19 lbs.

Killed—August 19th, 1905. [89 days after inoculation.]

Clinical Notes.

The calf was inoculated on May 22nd, 1905. The development of the tumour at the seat of inoculation, and of the prescapular gland, was similar to that usually seen in calves injected with 50 mg. of a virus of Group II.

The animal remained well during the whole period of the experiment, and was killed on August 19th, 1905, 89 days after inoculation.

Temperature.

The temperature rose sharply to 40·0° C. on the 11th day after inoculation, but quickly fell, and remained normal until the animal was killed.

Weights.

The calf gained weight very slowly during the experiment.

	cwt.	qrs.	lbs.	
May 22nd, 1905 - - -	1	0	19	Inoculated.
June 20th, 1905 - - -	1	0	24	
August 19th, 1905 - -	1	1	11	Killed

Total gain of weight during experiment.—20 lbs.

Average rate of gain per week.—1·5 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a small prominent fluctuating swelling, 2 in. by 1½ in. by ¾ in., which contained softened caseous material in a thin-walled cavity.

Right Prescapular Gland.—Was scarcely larger than normal, but seemed to contain more fibrous tissue. At one end was a little calcareous nodule.

Left Prescapular Gland and Right Prepectoral Gland.—Normal.

Thorax.

Pleura.—Normal.

Lungs.—In the left lung two minute translucent bodies were seen under the pleura, but they had no trace of opacity in their centres.

Bronchial and other Thoracic Glands, Heart.—Normal.

Abdomen.

Peritoneum, Intestines, Mesenteric Glands.—Normal.

Spleen, Liver, Portal Glands, Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Post-Pharyngeal, Hyoid.—Normal.

Tongue, Tonsils, Pharynx, Larynx.—Normal.

CALF 803. (Virus H 47. "S.B.").

Subcutaneous Inoculation of culture derived from human tissues throuh Guinea-Pig 1430.

Dose—50 milligrammes.

Date—May 22nd, 1905.

Weight at Inoculation—1 cwt. 0 qr. 20 lbs.

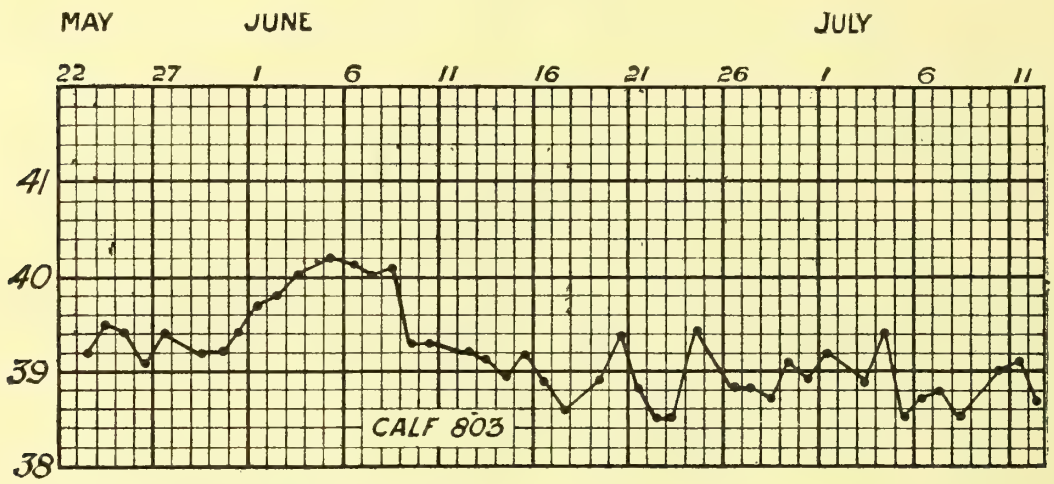
Killed—August 19th, 1905. [89 days after inoculation.]

Clinical Notes.

The calf was inoculated on May 22nd, 1905. The development of the tumour at the seat of inoculation, and of the prescapular gland, was similar to that usually seen in calves inoculated with 50 mg. of a virus of Group II.

The animal remained well during the whole period of the experiment and was killed on August 19th, 1905, 89 days after inoculation.

Temperature



From July 12th to August 19th, when the calf was killed, the temperature remained normal.

Weights.

The calf grew but little during the experiment.

	cwts.	qrs.	lbs.	
May 22nd, 1905 - - -	1	0	20	Inoculated.
June 20th, 1905 - - -	1	0	21	
August 19th, 1905 - - -	1	1	5	Killed.

Total gain of weight during experiment.—13 lbs.

Average rate of gain per week.—1 lb.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—The local lesion was represented by a small swelling surmounted by a scab, covering the opening of a sinus. On section a small amount of dense pinkish grey tissue containing calcareous grains was found around the sinus.

Right Prescapular Gland.—Was slightly enlarged. It contained three rather large caseo-calcareous nodules, together occupying the greater part of the gland.

Left Prescapular Gland, Right Prepectoral Gland, Axillary Glands.—Normal.

Thorax.

Pleura.—Normal.

Lungs.—On the dorsal surface of the right lung was a small slightly raised oval tubercle, $\frac{1}{8}$ in. in mean diameter, with a distinctly opaque centre, the greater part being grey and very translucent. Two minute circular translucent grey tubercles, with just visible opaque calcareous centres, were seen at the base of the right lung, and the same number at the base of the left.

Thoracic Glands, Heart.—Normal.

Abdomen.

Peritoneum.—Normal.

Intestines.—Contained a few little pultaceous yellow foci.

Mesenteric Glands.—Almost every gland contained little groups of calcareous grains.

Spleen, Liver, Portal Glands, Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Post-Pharyngeal, Hyoid.—Normal.

Tongue, Tonsils, Pharynx, Larynx.—Normal.

Microscopical Examination.

Oval Tubercle from Lung.—Tubercle bacilli few.

Little Calcareous Foci from Lung.—Tubercle bacilli few.

Pultaceous Foci from Intestine.—No tubercle bacilli.

VIRUS H 48. "W.P."

LUNG. (Post-mortem.)

TABLE 48.

VIRUS H 48. "W.P."

LUNG.

CULTURE INOCULATION.

May 23, 1905.

Strain derived from human lung, through G.P. 1494.

Total duration of artificial cultivation : six weeks.

Culture used for injection : 2nd subculture, 21 days old, on pure serum.



BULL-CALF 809.

Subcutaneous.

Dose : 50 mg.

Killed : August 21, 1905.

90 days.

P.M.—Fibrous walled cavity with softened caseous contents, at seat of inoculation. Few caseous foci in nearest lymphatic glands. (L.T.)

RABBITS.

418	50· mg.	Killed	90 days	Slight tuberculous peritonitis.
419	10· „	„	„	Slight tuberculosis of lungs. Trace in peritoneum and right kidney.
420	1· „	„	„	Trace of tuberculosis in peritoneum and lungs.
421	0·1 „	„	„	Slight tuberculosis of lungs. Trace in peritoneum.



COW-CALF 799.

Subcutaneous.

Dose : 50 mg.

Killed : August 21, 1905.

90 days.

P.M.—Small local tumour, caseo-necrotic and slightly calcareous. Fibro-calcareous lesions in nearest lymphatic glands. (L.T.)

VIRUS H 48. "W.P."

W.P., Male, aged 40, Admitted to Hospital on March 1st, 1905, suffering from Phthisis. Died on March 20th, 1905.

Family History.—Not recorded.

Clinical History.—The patient had had a cough for twelve months, and had been steadily losing weight for some time. He had never suffered from hæmoptysis.

On admission the patient was seen to be extremely emaciated and weak, and showed signs of advanced phthisis at the apex and base of the right lung. Crepitations were heard over the whole of the left upper lobe. The temperature was 101·6°, and it subsequently varied between 102° and 103°.

The patient steadily became worse, and died three weeks after admission.

POST-MORTEM EXAMINATION.

Thorax.

Lungs.—The left lung was not examined. The right lung showed scattered tubercles throughout, and contained a few small cavities.

Bronchial Glands.—Were enlarged and pigmented.

Abdomen.

Peritoneum.—Was normal.

Intestines.—Normal.

Mesenteric Glands.—Were very slightly enlarged, but showed no evidence of tuberculous disease.

Liver.—Was enlarged and fatty.

Kidneys.—Normal.

Spleen.—Normal.

Bones.—Normal.

Joints.—Normal.

Meninges of Brain.—Were not examined.

DESCRIPTION OF MATERIAL RECEIVED AT BLYTHWOOD.

Left Lung.—The lung was darkly pigmented, containing several cavities of moderate size, some with slate-coloured purulent contents. Others were filled with yellow caseous material. The lung was everywhere infiltrated with grey tubercles, more or less confluent, and these had small yellow caseous centres, so that the dark reddish-grey lung had the appearance of being peppered with irregular yellow spots. In some places the yellow foci had coalesced, forming caseous patches.

Peribronchial Glands.—Were black with pigment, but were not enlarged, and showed no sign of tubercle.

Microscopical Examination.

Three emulsions were made, one from the semisolid contents of the unopened cavity, which showed on microscopic examination extraordinary numbers of tubercle bacilli, comparable to those seen in preparations made from cultures.

The second emulsion was made from a portion of the lung containing fibrous tubercles with yellow centres, and this showed very large numbers of tubercle bacilli, uniformly distributed.

The third emulsion, prepared from a caseous patch at the base of the lung, showed extraordinary numbers of tubercle bacilli, and was very like the first.

CALF 809. (Virus H 48. "W.P.")

Subcutaneous Inoculation of culture derived from human lung, through Guinea-Pig 1494.

Dose—50 milligrammes.

Date—May 23rd, 1905.

Weight at Inoculation—1 cwt. 0 qr. 10 lbs.

Killed—August 21st, 1905. [90 days after inoculation.]

Clinical Notes.

The calf was inoculated on May 23rd, 1905.

The development of the tumour at the seat of inoculation, and of the nearest lymphatic gland, was similar to that usually seen in calves injected with 50 milligrammes of a virus of Group II.

The calf remained well during the whole period of the experiment, thought it did not grow. It was killed on August 21st, 1905, 90 days after inoculation.

Temperature.

Approximately normal throughout.

Weights.

The weight of the calf remained almost stationary during the experiment.

	cwts.	qrs.	lbs.	
May 23rd, 1905 - - -	1	0	10	Inoculated.
August 21st, 1905 - -	1	0	18	Killed.

Total gain of weight during experiment—8 lbs.

Tuberculin Test.

The calf was not tested subsequent to the inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a small fluctuating swelling, which measured 1½ in. by 1 in. by ¾ in., and contained softened caseous material in a thin fibrous wall.

Right Prescapular Gland.—Was not enlarged. It contained a group of caseous foci at one end.

Left Prescapular Gland.—Normal.

Right Prepectoral Gland.—Could not be found.

Axillary Glands.—Normal.

Thorax.

Pleura.—Normal.

Lungs.—Showed no signs of tuberculosis, but large parts of the anterior lobes were carnified, and elsewhere on the surface the fringes were somewhat hypertrophied.

Thoracic Glands, Heart.—Normal.

Abdomen.

Peritoneum, Intestines, Mesenteric Glands, Spleen, Liver, Portal Glands, Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal, Submaxilliary, Parotideal, Posterior Pharyngeal, Hyoid.—Normal.

Tongue, Tonsils, Pharynx.—Normal.

CALF 799. (Virus H 48. "W.P.")

Subcutaneous Inoculation of culture derived from human lung, through Guinea-Pig 1494.

Dose—50 milligrammes.

Date—May 23rd, 1905.

Weight at Inoculation—3 qrs. 25 lbs.

Killed—August 21st, 1905. [90 days after inoculation.]

Clinical Notes.

The calf was inoculated on May 23rd, 1905.

The development of the tumour at the seat of inoculation, and of the nearest lymphatic gland, was similar to that usually seen in calves injected with 50 milligrammes of a virus of Group II.

The calf remained well during the whole period of the experiment, and was killed on August 21st, 1905, 90 days after inoculation.

Temperature.

Approximately normal throughout.

Weights.

The calf grew moderately well during the experiment.

	cwt.	qrs.	lbs.	
May 23rd, 1905 - - -	0	3	25	Inoculated.
August 21st, 1905 - - -	1	1	3	Killed.

Total gain of weight during experiment.—1 qr. 6 lbs.

Average rate of gain per week.—2·6 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a small and fluctuating tumour, which on section was found partly softened and partly caseous, with a few calcareous grains, enclosed in a fibrous capsule. It measured 2 in. by 1½ in. by ¾ in.

Right Prescapular Gland.—Was not enlarged. It contained a fibro-caseous and calcareous nodule, about ⅝ in. in length.

Left Prescapular Gland.—Normal.

Right Prepectoral Gland.—About the size of a large pea; contained a fibro-calcareous nodule.

Axillary Glands.—Normal.

Cervical Glands.—A deep cervical gland contained a nodule similar to that in the prepectoral gland.

Thorax.

Pleura, Lungs, Thoracic Glands, Heart.—Normal.

Abdomen.

Peritoneum, Intestines, Mesenteric Glands, Spleen, Liver, Portal Glands, Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Uterus, Mammary Glands.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Post-Pharyngeal, Hyoid.—Normal.

Tongue, Tonsils, Pharynx, Larynx.—Normal.

VIRUS H 49. "T.C."

MESENTERIC GLANDS. (Post-Mortem.)

VIRUS H 49. "T.C."

MESENTERIC GLANDS.

CULTURE INOCULATIONS.

I.—June 7, 1905.

Strain derived from human mesenteric glands, direct.
Tested after 2 months artificial cultivation.
3rd subculture on pure serum used, 21 days old.



BULL-CALF 787.
Subcut.
Dose : 50 mg.
Died, August 27, 1905.
81 days.
General tuberculosis, moderate.

RABBITS.

448	50 mg.	Died, 39 days	Slight tuberculosis of perit., lungs and kidneys.
449	10 mg.	„ 69 „	G.T.
450	1 mg.	„ 87 „	Severe tuberculosis of perit. and lungs. Slight tuberculosis of kidneys.
451	0·1 mg.	„ 79 „	Slight tuberculosis of omentum. Severe tuberculosis of lungs and kidneys.



BULL-CALF 797.
Subcut.
Dose : 50 mg.
Killed, August 29, 1905.
83 days.
Caseous, non-infiltrating local lesion. Few caseous foci in nearest glands, and in thoracic glands. About 15 tubercles in lungs.

II. November 3, 1905.

Strain derived from human mesenteric glands, direct.
Tested after 7 months artificial cultivation.
6th subculture on pure serum used, 21 days old.



BULL-CALF 945.
Subcut.
Dose : 10 mg.
Killed (when well), February 7, 1906.
96 days.
Few tubercles in lungs, liver, spleen. Some caseo-calcareous foci in thoracic and hepatic glands. (G.T. slight.)



BULL-CALF 953.
Subcut.
Dose : 10 mg.
Died, February 19, 1906
108 days.
General tuberculosis, moderate.



BULL-CALF 957.
Subcut.
Dose : 50 mg.
Died, January 3, 1906.
61 days.
General tuberculosis, severe.



COW-CALF 959.
Subcut.
Dose : 50 mg.
Died, December 26, 1905.
53 days.
General tuberculosis, severe.

RABBITS.

658	10 mg.	Died, 35 days	Tuberculous peritonitis ; slight tuberculosis of lungs and kidneys.
659	1 mg.	„ 59 „	Tuberculosis of peritoneum, lungs, and kidneys.
660	1 mg.	„ 88 „	G.T.
661	0·1 mg.	„ 60 „	G.T.



RAT 46.
Intraperitoneal.
Dose : 75 mg.
Died, 213 days.
General dissemination of tubercle bacilli.

III.—November 1, 1905.

Strain derived from Calf 797, direct.
Tested after 2 months artificial cultivation.
1st subculture on pure serum used, 21 days old.



BULL-CALF 931.
Subcut.
Dose : 50 mg.
Died, November 22, 1905.
21 days.
General tuberculosis, severe.



BULL-CALF 949.
Subcut.
Dose ; 50 mg.
Died, December 10, 1905
39 days.
General tuberculosis, severe.

RABBITS.

654	10 mg.	Died, 15 days	G.T. acute.
655	1 mg.	„ 21 „	G.T.
656	1 mg.	„ 21 „	G.T.
657	0·1 mg.	„ 24 „	G.T.



BULL-CALF 939.
Subcut.
Dose : 10 mg.
Dying, December 10, 1905.
39 days.
General tuberculosis, severe.



BULL-CALF 933.
Subcut.
Dose : 10 mg.
Died, November 20, 1905.
19 days.
General tuberculosis, moderate.

VIRUS H 49. "T.C."

CULTURE INOCULATIONS WITH THE VIRUS DERIVED FROM THE HUMAN MESENTERIC GLANDS, AFTER LOSS OF VIRULENCE.

I. January 3rd, 1906.

Strain derived from human mesenteric glands, direct.

Tested after 9 months' artificial cultivation.

7th subculture on pure serum used, 21 days old.

RABBITS.

761	1 mg.	Killed 121 days	Trace of tuberculosis in peritoneum and lungs.
762	0·1 mg.	„ 121 „	„ „

II. May 25th, 1906.

Strain derived from human mesenteric glands, direct.

Tested after 14 months' artificial cultivation.

14th subculture on pure serum used, 20 days old.



BULL-CALF 1097.

Subcutaneous.

Dose : 50 mg.

Killed : August 22nd, 1906.

89 days.

Small local tumour. Caseo-calcareous nodules in prescapular gland. One small tubercle in kidney (S.T.)

RABBITS.

904	10 mg.	Killed	Slight tuberculosis of omentum and kidneys.
905	10 mg.	89	Trace of tuberculosis in omentum only.
906	1 mg.	days.	As in Rabbit 904.

VIRUS H 49. "T.C."

T. C., Male, Aged Eighteen, Admitted to Hospital on March 21st, 1905, Suffering from Pulmonary Phthisis. Died April 4th, 1905.

Family History.—No reliable family history could be obtained.

Clinical History.—The disease was apparently of somewhat long standing. In 1904 the patient stated that he had been in hospital on account of "spitting of blood," and he had had a cough off and on ever since. He had recently attended another hospital as an out-patient.

On admission the patient was extremely ill, with a temperature of 103°. There were signs of advanced phthisis in both lungs.

The patient rapidly sank, and died two weeks after admission.

POST-MORTEM EXAMINATION.

Lungs.—Both lungs showed signs of extensive tuberculous disease.

Bronchial Glands.—Were enlarged.

Peritoneum.—There was slight peritonitis, but no apparent tuberculosis of the peritoneum.

Intestines.—Showed no ulceration.

All the other organs and glands in the body were apparently healthy.

DESCRIPTION OF MATERIAL SENT TO BLYTHWOOD.

The Left Lung and the Mesenteric Glands were received.

Left Lung.—Several large and a number of smaller hard masses could be felt from the surface. On section the smaller, distributed throughout the greater part of both lobes, were reddish-grey in colour, and fibrous, and their irregular margins were composed of a number of opaque whitish spots, more or less radially arranged. These patches were for the most part somewhat rounded, or elongated and connected together. The larger masses which almost filled the apices of the two lobes, were composed of similar tissue, but the arrangement of fibrous and caseating parts was less regular. There were no definite cavities, but some thin-walled tubular spaces about a fifth of an inch in diameter, and containing purulent fluid, were seen. These were possibly dilated bronchi.

Bronchial Glands.—Were slightly enlarged, and contained a few small miliary tubercles, but there was no caseation.

Mesenteric Glands.—From four or five of these glands lobulated masses of stony hardness, and about the size of haricot beans, were extracted. It was impossible to cut them with a knife, and they were so hard that they could only with difficulty be broken with a heavy glass pestle. Their interior contained dry putty-like matter. Some of the remaining glands contained an occasional small tubercle, or little caseating patches.

Microscopical Examination.

Mesenteric Gland (soft).—Tubercle bacilli numerous.

Mesenteric Gland (hard).—Tubercle bacilli found.

Emulsion made from Lung.—Tubercle bacilli numerous.

Emulsion made from Mesenteric Glands.—Tubercle bacilli fairly numerous.

From the appearance of the lesions at the post-mortem, and from the subsequent more careful examination at Blythwood, there appeared to be no room for doubt that the disease was primary in the mesenteric glands, and secondary in the lung.

CALF 787. (Virus H 49. "T.C.")

Subcutaneous Inoculation of culture derived from human mesenteric glands.

Dose—50 milligrammes.

Date—June 7th, 1905.

Weight at Inoculation—3 qrs. 15 lbs. (Age about 8 weeks.)

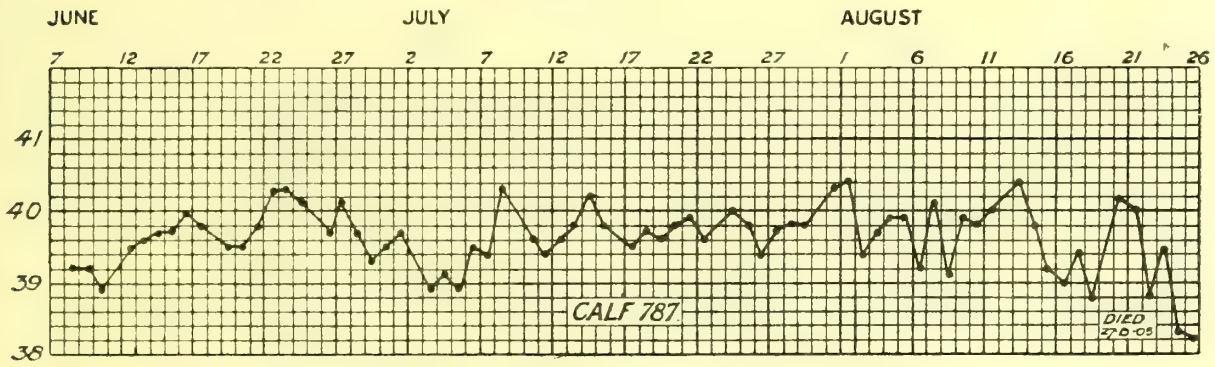
Died—August 27th, 1905. [81 days after inoculation.]

Clinical Notes.

The calf was inoculated on June 7th, 1905.

A rather large tumour arose at the seat of inoculation, and the animal gradually became very thin. About the middle of August it was ill, and the respiration was affected. After this it slowly grew worse, but death occurred quite unexpectedly on August 27th, 81 days after inoculation.

Temperature.



Weights.

	qrs.	lbs.	
June 7th, 1905 - - - -	3	15	Inoculated.
June 20th, 1905- - - -	3	10	
August 27th, 1905 - - -	3	3	Died.

Total loss of weight during experiment.—12 lbs.

Average rate of loss per week.—1 lb.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Very thin; fat replaced in many places, *e.g.*, hilum of kidney, by œdema fluid.

Local Lesion.—At the seat of inoculation on the right side of the neck was a large local lesion, measuring 5 in. by 3½ in. by 2½ in., and weighing 12 ozs. It infiltrated the skin and muscle widely, and its central part was commencing to soften into thick putty-like matter (not into the mucoid substance seen in tumours formed by the non-virulent viruses). Here and there calcareous grains occurred.

Right Prescapular Gland.—Enlarged. It measured 3 in. in length and weighed 6 ozs. It was caseo-necrotic throughout and contained scattered calcareous grains.

Left Prescapular Glands.—Normal.

Right Pectoral Gland.—One inch in greatest diameter; was similar in structure.

Axillary Glands.—Normal.

Thorax.

Pleura.—One or two tubercles were seen on the costal pleura and on the surface of the diaphragm, and a good many smaller fibrous tubercles on the pleural surface of the pericardium.

Lungs.—Were slightly adherent to the pleura at the left apex. The surfaces of both were studded with large and small prominent masses, the largest of which were over 1 in. in diameter, while many were quite small. The lung tissue between was much congested. Section showed caseous nodules of various sizes, some 1 in. or more in diameter, others smaller, but many about the size of large peas, widely but not very thickly distributed throughout the lungs.

Thoracic Glands.—The thoracic glands, especially the left bronchial, were much enlarged. They were very firm, and on section were seen to be composed almost entirely of dense translucent grey tissue, with a yellow network, sparsely distributed about several deep-seated centres.

The posterior thoracic measured 5 in. by 1¾ in. by 2 in., and weighed 3 ozs.

The left bronchial measured 3¼ in. by 2¼ in. by 2 in., and weighed 3 ozs.

Heart.—Normal.

Abdomen.

Intestines, Mesenteric Glands.—Normal.

Spleen.—Contained three tubercles, caseous, with calcareous grains; the largest was as large as a small pea.

Liver.—Showed half a dozen small tubercles on its surface, and two were found after rather a long search in its interior. The liver substance seemed firmer than normal, but perhaps that was due merely to wasting of the parenchyma.

Hepatic Glands.—Very slightly enlarged, firm, translucent and fibrous, like the thoracic, but with still less caseous network.

Kidneys.—The left kidney contained three or four small wedgeshaped tuberculous infarcts, the largest about a ¼ in. in diameter, on the surface.

In the right only one small tubercle was found.

Suprarenals.—A very small tubercle was found in each.

Renal Glands.—Were enlarged; one was 1½ in. in its longest, and almost as much in its other diameters. It was grey, translucent and fibrous, with scarcely a trace of caseation of calcification.

Right Iliac Gland.—A nodule of similar structure was found in the right iliac gland.

Left Iliac Gland.—Normal.

Lumbar Glands.—Normal.

Special Glands.

Precrural, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Posterior Pharyngeal, Hyoid.—Normal.

Microscopical Examination.

Scraping from Prepectoral Gland.—Numerous tubercle bacilli.

Emulsion of Prescapular Gland.—Numerous tubercle bacilli.

CALF 797. (Virus H 49. "T.C.")

Subcutaneous Inoculation of culture derived from human mesenteric glands.

Dose—50 milligrammes.

Date—June 7th, 1905.

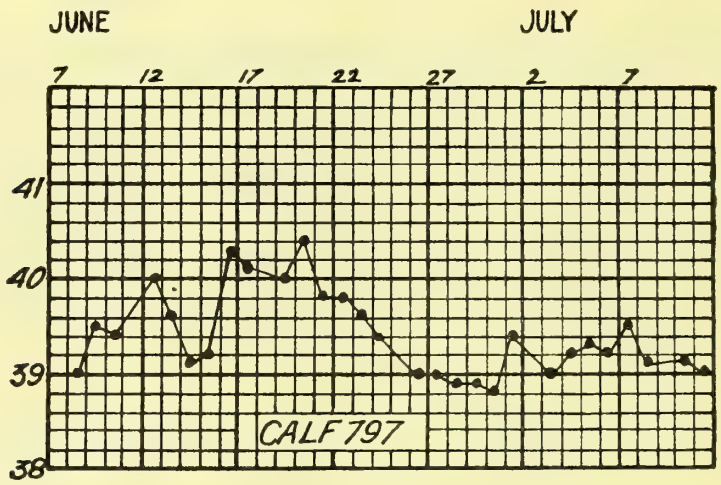
Weight at Inoculation—3 qrs. 14 lbs. (Age about 8 weeks.)

Killed—August 29th, 1905. [83 days after inoculation.]

Clinical Notes.

The calf was inoculated on June 7th, 1905. Unlike its fellow, No. 787, the calf remained well, and grew normally. It was killed on August 29th, 1905, 83 days after inoculation.

Temperature.



From July 12th to August 29th, when the calf was killed, the temperature remained approximately normal.

Weights.

The calf grew normally during the period of the experiment.

	cwts.	qrs.	lbs.	
June 7th, 1905 - - -	0	3	14	Inoculated.
August 29th, 1905 - -	1	0	25	Killed.

Total gain of weight during experiment.—1 qr. 11 lbs.

Average rate of gain per week.—3·25 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—The tumour at the seat of inoculation, on the right side of the neck, was like those produced by non-virulent viruses. It was prominent, oval, and fluctuating; it was easily dissected from the surrounding tissues, and consisted of a thin fibrous bag, full of softened caseous matter.

Right Prescapular Gland.—Was scarcely at all enlarged. It contained in the cortex eight or nine tubercles, with softened caseous centres, each tubercle being from a $\frac{1}{16}$ in. to $\frac{1}{8}$ in. in diameter.

Left Prescapular Gland.—Normal.

Right Prepectoral Gland.—Contained a tubercle similar to that in the right prescapular gland.

Axillary Glands.—Normal.

Thorax.

Pleura.—Normal.

Lungs.—On the surface of the right lung twelve tubercles were seen. The larger were $\frac{1}{8}$ in. in diameter. They were irregular in shape, pinkish grey and translucent, with here and there a tiny focus of caseation. They were quite unlike the little calcareous foci often seen in calves injected with non-virulent viruses. Several smaller ones were seen on the surface of the left lung. None were detected on section.

Thoracic Glands.—Not enlarged. The long posterior thoracic gland contained two or three small caseous foci. The left bronchial and one other contained rather larger (an eighth of an inch) and distinctly caseous tubercles.

The peribronchial glands were normal.

Heart.—Normal.

Abdomen.

Peritoneum, Intestines, Mesenteric Glands, Spleen, Liver, Portal Glands, Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Posterior Pharyngeal, Hyoid.—Normal.

Tongue, Tonsils, Pharynx.—Normal.

Microscopical Examination.

Emulsion of Caseous Centres of Tubercles in the Prescapular Gland.—Tubercle bacilli.

Emulsion of Tubercles from Lung.—Tubercle bacilli.

Caseous Focus from a Thoracic Gland.—Tubercle bacilli scanty.

CALF 945. (Virus H 49. "T.C.")

Subcutaneous Inoculation of Culture derived from human mesenteric glands.

Dose—10 milligrammes.

Date—November 3rd, 1905.

Weight at Inoculation—3 qrs. 24 lbs. (Age about 9 weeks.)

Killed—February 7th, 1906. [96 days after inoculation.]

Clinical Notes.

The calf was inoculated on November 3rd, 1905. A fluctuating tumour developed at the seat of inoculation and the prescapular gland became considerably enlarged. The calf remained in good health during the period of the experiment, and was killed on February 7th, 1906, 96 days after inoculation.

Temperature.

Approximately normal throughout.

Weights.

The calf grew very rapidly during the experiment.

	cwt.	qrs.	lbs.	
November 3rd, 1905 - -	0	3	24	Inoculated.
February 7th, 1906 - -	1	2	20	Killed.

Total gain of weight during experiment.—2 qrs. 24 lbs.

Average rate of gain per week.—5·8 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—At the seat of inoculation, on the right side of the neck, there was a prominent semi-fluctuating swelling, which measured 4½ in. by 2½ in. by 2 in., and weighed 6 ozs. It contained serous fluid and softened caseous débris, and large irregular necrotic masses, still more or less adherent to the fibrous wall. The fibrous wall itself was infiltrated with slightly calcareous tubercles, but the skin and subjacent muscle were not invaded.

Right Prescapular Gland.—Was enlarged, and measured 3½ in. by 2 in. by 1½ in., and weighed 4 ozs. It contained some pinkish necrotic masses, but was principally composed of a dense yellowish caseo-calcareous network.

Left Prescapular Gland, Right Prepectoral Gland, Axillary Glands.—Normal.

Thorax.

Pleura.—Normal.

Lungs.—On the surface of the lungs a number of small irregular grey translucent tubercles could be seen. They were rather numerous on the surface of the second lobe on the right side. In addition to this larger tubercles could be felt in the substance of the lung, and sometimes seen to form a nodule on the surface. These were not very obvious to the sight, but could be more readily felt. They were about the size of sweet pea seeds, grey and fibrous, and contained yellow caseous and calcareous centres. There were about a dozen of these in each lung. One of the lobules in the left lung was entirely infiltrated with little tuberculous foci.

Trachea.—Normal.

Thoracic Glands.—Were slightly enlarged. They contained numerous caseo-calcareous grains collected together into groups, and sometimes confluent. The greater part of the gland tissue appeared to be normal.

One peribronchial gland was enlarged, and contained caseous foci.

Heart.—Normal.

Abdomen.

Peritoneum, Omentum.—Normal.

Intestines, Mesenteric Glands.—Normal.

Spleen.—In the spleen were seven fibro-caseous tubercles of the size of large shot.

Liver.—On the surface of the liver two little superficial tubercles were seen. Another was just visible beneath the surface. One only was found on section.

Portal Glands.—Were not enlarged. They contained groups of slightly calcareous yellow foci in their cortices.

Kidneys, Suprarenals.—Normal.

Renal Glands.—One of the renal glands contained a tubercle.

Lumbar Glands, Iliac Gland.—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal, Submaxillary, Subparotid, Posterior Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx, Larynx.—Normal.

Eyes.—Normal.

CALF 953. (Virus H 49. "T.C.")

Subcutaneous Inoculation of culture derived from human mesenteric glands.

Dose—10 milligrammes.

Date—November 3rd, 1905.

Weight at Inoculation—3 qrs. 15 lbs. (Age about 8 weeks.)

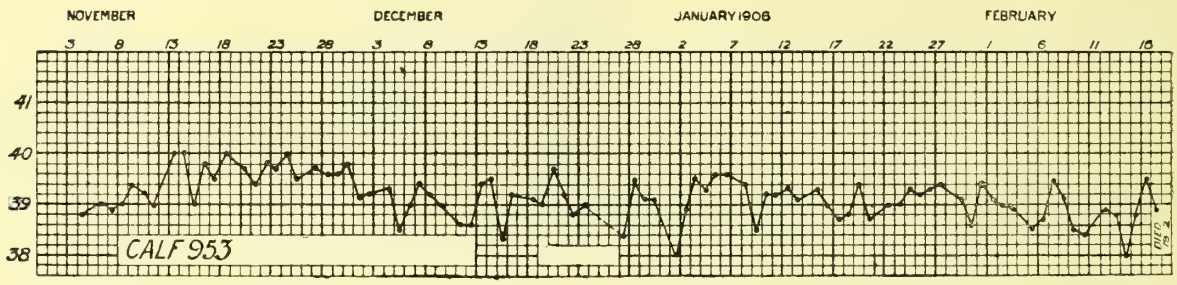
Died—February 19th, 1906. [108 days after inoculation.]

Clinical Notes.

The calf was inoculated on November 3rd, 1905. Towards the end of December the calf became very thin and ill, and the respiration was accelerated. Its condition improved during January; the respiration was always accelerated, but not distressingly so, and it was very variable, periods of slow deep breathing alternating with others which were rapid and shallow. The animal was always found standing up and taking notice of what went on around it.

About the middle of February it was noticed to be getting worse; it began to hang its head, and the respiration became more accelerated. This change was seen to be progressive from day to day. The calf died on February 19th, 1906, 108 days after inoculation, from pulmonary hæmorrhage and obstruction of the larynx. It was undoubtedly very ill when it died and could not have lived long, though it might have lasted for another week or ten days had it not been for the hæmorrhage.

Temperature.



Weights.

	qrs.	lbs.	
November 3rd, 1905 - - -	3	15	Inoculated.
February 19th, 1906 - - -	3	19	Died.

Total gain of weight during experiment.—4 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Thin.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a flattened solid tumour, which measured $4\frac{3}{4}$ in. by 4 in. by $1\frac{3}{4}$ in., and weighed 14 ozs. It was composed of yellowish white fibro-necrotic tissue, and contained a small central cavity. It widely infiltrated the subjacent muscle. The skin over a large area of the tumour was necrotic, and separated by a process of ulceration from the tumour beneath.

Right Prescapular Gland.—Was much enlarged. It measured $4\frac{1}{4}$ in. by $2\frac{1}{4}$ in. by $1\frac{3}{4}$ in., and weighed 7 ozs. It was of a yellowish pink colour, caseo-necrotic throughout, and sparsely peppered with minute calcareous grains.

Left Prescapular Gland.—Normal.

Right Prepectoral Gland.—A quarter of an inch in diameter. Was similar in structure to the right prescapular gland.

Left Axillary Gland.—Normal.

Right Axillary Gland.—Contained a fibro-caseous tubercle $\frac{1}{2}$ in. in diameter.

Thorax.

Pleura.—There were a few prominent tubercles on the costal pleura, most of them situated in a little group near the head of the right twelfth rib.

Lungs.—Were somewhat enlarged, and weighed 6 lbs. None of the lobes were consolidated throughout, but there were large solid lobules, widely distributed, which rose above the general surface. Of these there were two contiguous ones, which measured together some 3 in. by $1\frac{1}{2}$ in., in the right anterior lobe, and another rounder nodule, 2 in. in diameter, in the right posterior lobe. Similar, but smaller, nodules, from 1 in. in diameter downwards—many of them about $\frac{1}{4}$ in.—were widely scattered throughout both lungs. The surface of the rest of the lung was mottled with little angular patches of dark purple, each of the smaller of which contained a slightly prominent central tubercle, but many of the larger ones contained groups of tubercles. On section numerous solid fibro-caseous nodules were seen, of irregular, sometimes angular, shape, many of them being $\frac{3}{4}$ in. or more in diameter. Besides there were numerous smaller caseous tubercles, each surrounded with a dark purple zone, which was often confluent with its neighbour.

Larynx.—In the larynx was a blood clot, which completely blocked the passage.

Trachea.—On opening the trachea, this clot was found to extend towards the lungs for a distance of 6 to 8 in. It was lying quite loose in the trachea, in which there was neither ulceration nor tubercles. It had obviously come from the lungs, and was too wide to pass the glottis. The posterior part of the trachea and the larger bronchi were empty. The source of the hæmorrhage was not found.

Thoracic Glands.—Were much enlarged, particularly the left bronchial, which weighed 2 ozs. The long thoracic gland measured 4¾ in. by 2 in. by 1¼ in., and weighed 4 ozs. All the glands were caseo-necrotic throughout, being very similar to the right prescapular.

Heart.—Normal.

Abdomen.

Peritoneum, Omentum.—The omentum contained a few small tubercles, and the villous tufts were hypertrophied. In the diaphragm was a large fibro-caseous nodule, visible from both surfaces, but projecting into the peritoneal cavity. It measured 1 in. by ¾ in.

Intestines.—In the small intestine were found two perfectly circular nodules, raised about ⅛ in., each having a deep central ulcer containing a slough. One was situated about the middle of the intestine, the other in the continuous lymphoid patch at its termination. There were also one or two small caseous foci.

In the large intestine there were about half a dozen similar ulcers, together with one or two smaller ones. They were less regular in shape than those in the small intestine, and in the largest there was an irregular slough ½ in. in diameter.

Mesenteric Glands.—The majority were normal. About half a dozen, including the cœliac, were enlarged, some being as much as 1 in. in long diameter. They were fibro-caseous throughout. One of the largest was alone in the middle of the mesentery; the others were grouped at the two ends of the chain.

Spleen.—Was small, the surface presenting many large nodules caused by deeply seated tubercles. Section showed about thirty or forty large solid round tubercles from a ¼ in. to ½ in. in diameter, dense and fibro-caseous, which contained a few calcareous points.

Liver.—Was rather small. On its surface were about a dozen prominent yellow tubercles. About half of these were compound, being formed by the confluence of several tubercles. The largest of these formed a nodule about a ¼ in. in diameter. A large section of the organ showed half a dozen or more tubercles, the largest being about ⅓ in. in diameter.

Portal Glands.—Were much enlarged. They resembled the thoracic, being fibro-caseous, and having small calcareous foci.

Kidneys.—About half a dozen minute tubercles were found in the left kidney. A few occurred in the right, and in addition a fibro-caseous nodule in the cortex ⅓ in. in diameter.

Suprarenals.—There was a small fibrous tubercle with a small opaque centre in the right suprarenal. The left was normal.

Renal Glands, Lumbar Glands.—Were greatly enlarged, and fibro-caseous throughout, resembling the thoracic.

Iliac Gland.—The right iliac gland contained three small tubercles. The left was normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Right Precrural.—Contained a fibro-caseous tubercle ¼ in. in diameter.

Left Precrural, Pubic, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal.—Normal.

Post-Pharyngeal.—Two on the left side each showed a round fibro-caseous tubercle, one being as large as a pea, the other ½ in. in diameter. The gland on the right side was normal.

Hyoid.—The left was slightly enlarged, ½ in. in diameter, and fibro-caseous throughout. The right was normal.

Tongue, Tonsils.—Normal.

Pharynx.—In the posterior wall of the pharynx was a single small tubercle.

Brain.—Normal.

Eyes.—There was a small tubercle in the ciliary process of the left eye.

Microscopical Examination.

Ulcer from Large Intestine.—Tubercle bacilli.

CALF 957. (Virus H 49. "T.C.")

Subcutaneous Inoculation of culture derived from human mesenteric glands.

Dose—50 milligrammes.

Date—November 3rd, 1905.

Weight at Inoculation—3 qrs. 15 lbs. (Age about 8 weeks.)

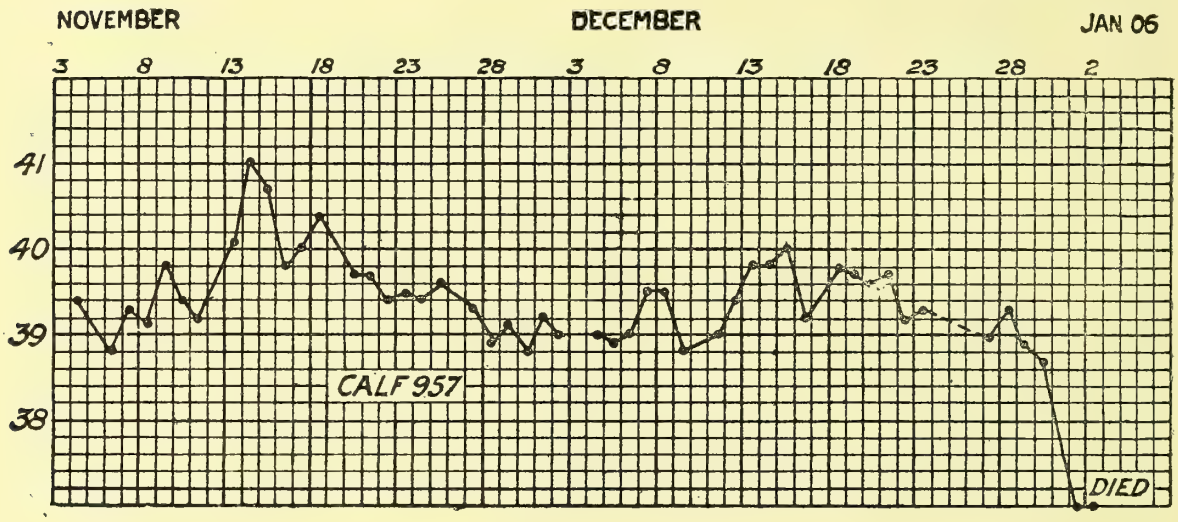
Died—January 3rd, 1906. [61 days after inoculation.]

Clinical Notes.

The calf was inoculated on November 3rd, 1905.

A large solid tumour developed at the seat of inoculation and the nearest lymphatic glands became greatly enlarged. The temperature rose to 41·0° C. on the 11th day, and the calf became very ill, dying on January 3rd, 1906, 61 days after inoculation.

Temperature.



Weights.

	qrs.	lbs.	
November 3rd, 1905 - - -	3	15	Inoculated
January 3rd, 1906 - - -	3	14	Died.

Total loss of weight during experiment.—1 lb.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Poor.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a very large swelling, which measured $7\frac{3}{4}$ in. by 5 in. by $2\frac{1}{2}$ in., and weighed 1 lb. 14 ozs.

There was a good deal of œdema below. The tumour reached the middle line of the neck, infiltrated skin and subjacent muscle, and consisted of dense caseo-necrotic tissue, with a large ragged central cavity containing clear serum.

Right Prescapular Gland.—Measured $3\frac{5}{8}$ in. by 2 in., and weighed 4 ozs.

It was dense, fibro-necrotic, and contained numerous caseous and slightly calcareous foci.

Pectoral Glands.—The oval pectoral gland, $1\frac{3}{8}$ in. in diameter, was almost entirely composed of a large fibro-caseous nodule, rather softer than those mentioned above.

Left Prescapular Gland.—Was slightly enlarged, and contained a nodule similar to that in the right pectoral.

Right Prepectoral Gland.—As large as a marble, was similar in structure to the right prescapular.

Left Prepectoral Gland.—The size of a pea, also contained a similar nodule with calcareous grains.

Cervical Glands.—Some deep cervical glands on the right side were much enlarged and fibro-necrotic in structure.

Some smaller ones on the left side were similar in structure, but somewhat less severely affected.

Axillary Glands.—Normal.

Thorax.

Pleura.—There were a few small tubercles on the costal pleura.

Lungs.—The lungs weighed 5 lbs. The anterior parts were much congested. They were studded fairly thickly with tubercles, which were prominent in the anterior and inferior parts, and were about $\frac{1}{8}$ in. or $\frac{1}{6}$ in. in diameter. Here and there they were confluent, making a larger nodule. Similar tubercles were seen scattered throughout the lung, and many of the lobules were solid, forming fibro-caseous areas $\frac{1}{4}$ in. or $\frac{1}{2}$ in. in diameter.

Trachea.—Normal.

Thoracic Glands.—Were greatly enlarged, and together weighed 8 ozs. The long thoracic gland measured $4\frac{3}{4}$ in. by $1\frac{3}{4}$ in. by $1\frac{1}{8}$ in., and weighed 3 ozs.

They were all of them very dense, and consisted of grey tissue, with caseous foci and striæ. Here and there a calcareous grain could be felt.

Heart.—Several tubercles were seen in the right auricle and two in the right ventricle. The left side was normal.

Abdomen.

Peritoneum, Omentum.—There were a few tubercles on the omentum and on the peritoneal surface of the diaphragm.

Intestines.—The small intestine contained about a dozen tuberculous foci in the Peyer's patches, slightly raised, with caseous centres.

Mesenteric Glands.—The mesenteric glands were some of them enlarged. All contained caseo-fibrous nodules, and in a few the cortex was entirely composed of this substance.

Spleen.—Was not enlarged. It contained a fairly large number of large fibro-caseous tubercles up to a $\frac{1}{4}$ in. in diameter.

Liver.—A moderate number of tubercles were seen on the surface of the liver; about seventy were counted on the anterior surface. Some of these were flattened, had overhanging margins, and measured $\frac{1}{8}$ in. or $\frac{1}{6}$ in. in diameter. Many others were smaller, but most of them seemed to be superficial. About twenty small tubercles were seen on a longitudinal section.

Hepatic Glands.—Much enlarged, and were very similar in structure to the thoracic, perhaps not quite so dense.

Kidneys.—The right contained about a dozen tubercles in the cortex, many of which were superficial and prominent, and consisted of a wedge-shaped fibrous mass of caseous points. Some of these masses were a $\frac{1}{4}$ in. in diameter.

The left was similar, but less affected.

Suprarenals.—The left contained a doubtful tubercle. The right was normal.

Renal Glands, Lumbar Glands.—Were much enlarged, and similar in structure to the hepatic.

Iliac Glands.—Contained caseo-fibrous nodules.

Genito-Urinary System.

Normal.

Special Glands.

Precrural.—The left contained irregular caseo-fibrous nodules in the cortex. The right contained shot-sized tubercles of similar structure.

Pubic, Gluteal, Popliteal.—Contained tubercles.

Left Ischiatic.—Normal.

Right Ischiatic.—Could not be found.

Submaxillary.—The left was normal. The right contained a large fibro-caseous nodule $\frac{3}{4}$ in. by $\frac{1}{2}$ in.

Parotideal.—The right contained two small tubercles. The left a caseo-fibrous nodule.

Retropharyngeal.—Both contained fibro-caseous nodules a $\frac{1}{4}$ in. in diameter.

Hyoid.—The left contained one small tubercle. The right was normal.

Tongue, Palate.—Normal.

Tonsils.—The left tonsil contained two small tubercles. The right was normal.

Pharynx.—Normal.

Eyes.—The right eye contained a tubercle in the ciliary process of the choroid.

CALF 959. (Virus H 49. "T.C.")

Subcutaneous Inoculation of culture derived from human mesenteric glands.

Dose—50 milligrammes.

Date—November 3rd, 1905.

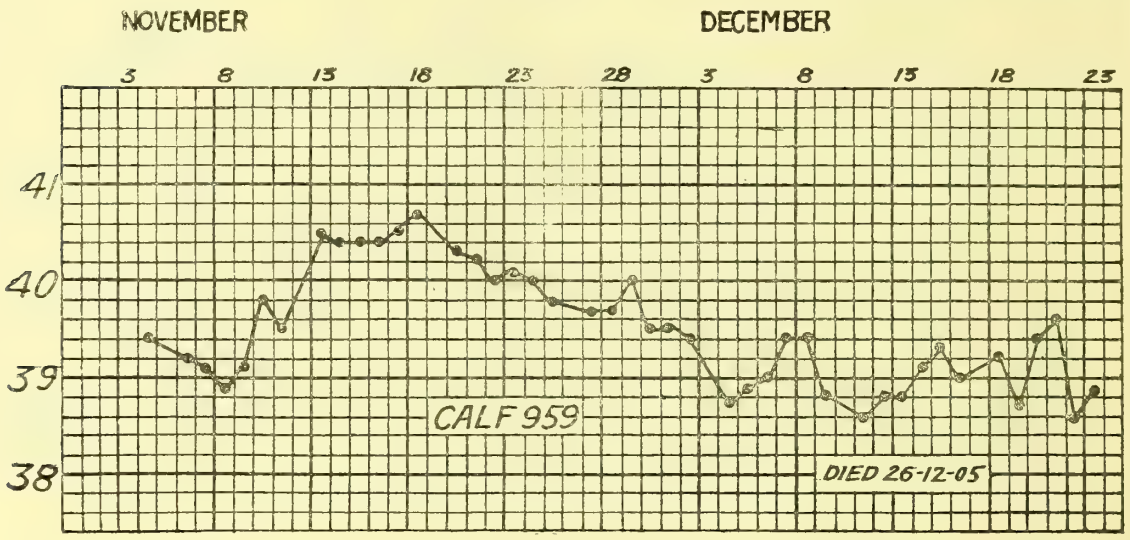
Weight at Inoculation—3 qrs. 9 lbs. (Age about 7 weeks.)

Died—December 26th, 1905. [53 days after inoculation.]

Clinical Notes.

The calf was inoculated on November 3rd, 1905. A solid flat swelling developed at the seat of inoculation, and the prescapular gland became considerably enlarged. The temperature rapidly rose, reaching 40·7°C. on the 15th day. The animal became very ill, and the respiration was greatly accelerated; it died on December 26th, 53 days after inoculation.

Temperature.



Weights.

	qrs.	lbs.	
November 3rd, 1905 - - -	3		9 Inoculated.
December 26th, 1905 - - -	3		8 Died.

Total loss of weight during experiment.—1 lb.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Fair.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a solid flat swelling of moderate size, which measured 4¾ in. by 2½ in. by 1 in., and weighed 6 ozs. It consisted of the usual tough necrotic mass, and infiltrated the subjacent muscle, but the skin only slightly.

Right Prescapular Gland.—Was enlarged, and measured 3 in. by 1¾ in. by 1¼ in. Its weight was 2 ozs. It was caseo-necrotic throughout.

Left Prescapular Gland.—Contained a few scattered caseous tubercles.

Right Prepectoral Gland.—As large as a big pea, was caseo-necrotic.

Right Axillary Gland.—Contained a few scattered caseous tubercles.

Left Axillary Gland.—Was normal.

Thorax.

Pleura.—There were a few tubercles scattered over the costal pleura.

Lungs.—Were large; the anterior parts dark red, solid, and studded with tubercles about ⅛ in. in diameter. They were firm, and on section appeared almost entirely solid, thickly infiltrated with irregular caseous foci, many of which were confluent one with another, making little spots of larger size.

Trachea.—Normal.

Thoracic Glands.—Were much enlarged. All together weighed 6 ozs. The long thoracic gland alone measured 5¾ in. by 1¾ in. by ¾ in., and weighed 2 ozs. They were firm and solid, being composed of translucent grey tissue thickly interspersed with irregular caseous centres.

Heart.—No tubercles were seen in the right auricle; one small one was visible in the wall of the right ventricle, and a rather large one in that of the left.

Abdomen.

Peritoneum, Omentum.—The omentum contained some shot-sized tubercles.

Intestines.—The Peyer's patches of the small intestine, and especially the long terminal one in the ileum, contained numerous minute tuberculous foci.

The large intestine was normal.

Mesenteric Glands.—Were some of them slightly enlarged, and all contained one or two large tuberculous nodules, grey and translucent, packed with opaque yellow foci. Some of these were as large as small peas.

Spleen.—The spleen contained a large number of large yellow tubercles, mostly about ⅛ in to ⅙ in. in diameter, and some even a little larger. In the thinner parts they could be seen projecting on the surface of the organ, which was not enlarged, and not firmer than normal.

Liver.—The liver was studded with flat raised tubercles, with thin grey overhanging margins. They varied in size, many being ⅙ in. or even more in diameter. A fairly large number of rather small tubercles were scattered throughout the organ.

Hepatic Glands.—Were enlarged, the cortex being tuberculous, like the thoracic.

Kidneys.—The kidneys showed fairly numerous tubercles, and yellow spots, each composed of a cluster of little tubercles, just under the capsule. The same were seen in the cortex on section.

Suprarenals.—Two or three small tubercles were seen in each.

Renal Glands, Lumbar Glands.—Were enlarged and packed with confluent tubercles.

Iliac Glands.—Contained a few scattered caseous tubercles.

Genito-Urinary System.

Uterus.—One yellow spot (no tubercle bacilli seen in it) was found in the uterus.

Mammary Gland.—Normal.

Special Glands.

Precrural, Pubic, Glutcal, Ischiatic, Popliteal.—Contained a few scattered caseous tubercles.

Submaxillary, Parotideal, Retropharyngeal.—Each contained a few caseous tubercles.

Hyoid.—The right was normal; the left contained a single tubercle.

Tongue, Tonsils, Pharynx, Larynx.—Normal.

Microscopical Examination.

Foci from Small Intestine.—Tubercle bacilli numerous.

Yellow Spot from Uterus.—No tubercle bacilli.

CALF 931. (Virus H 49. "T.C.")

Subcutaneous Inoculation of culture derived from Calf 797.

Dose—50 milligrammes.

Date—November 1st, 1905.

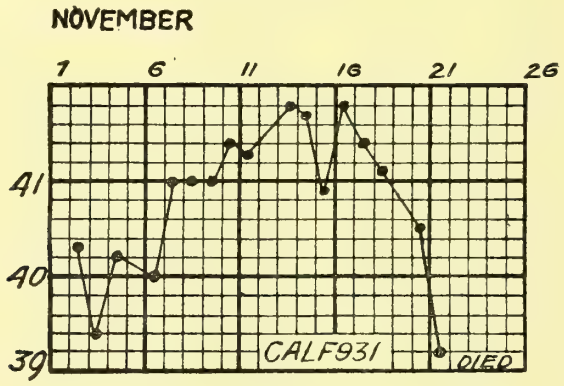
Weight at Inoculation—1 cwt. 0 qrs. 12 lbs. (Age about 12 weeks.)

Died—November 22nd, 1905. [21 days after inoculation.]

Clinical Notes.

The calf was inoculated on November 1st, 1905. The temperature quickly rose, reaching 41·8° C. on the 12th day, and the animal became very ill. The disease progressed with exceptional rapidity, and the calf died on November 22nd, 1905, 21 days after inoculation.

Temperature.



Weights.

	cwts.	qrs.	lbs.	
November 1st, 1905 -	1	0	12	Inoculated.
November 22nd, 1905	1	0	3	Died.

Total loss of weight during experiment.—9 lbs.

Average rate of loss per week.—3 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Poor.

Local Lesion.—At the seat of inoculation on the right side of the neck was a solid tumour, which measured 5½ in. by 3 in. by 1¼ in., and weighed 8 ozs.

On section it was salmon pink, fibro-necrotic, and infiltrated skin and subjacent muscle.

Right Prescapular Gland.—Was enlarged, measured 3½ in. by 1½ in. by 1¾ in., and weighed 4 ozs. It was caseo-necrotic throughout, and not quite so dense as usual.

Left Prescapular Gland.—Was swollen and more opaque than normal, and contained more or less definite points or tubercles.

Right Prepectoral Gland.—Was as large as a large pea. It was caseo-necrotic throughout, not quite so dense as usual.

Axillary Gland.—Was swollen and more opaque than normal, and resembled the left prescapular.

Cervical Glands.—A deep cervical gland was much enlarged. It was firm, but pink, and very similar to the thoracic.

Thorax.

Pleura.—Showed scarcely any change.

Lungs.—Were large and heavy, and dark red in colour, very like those of Calf 933. They weighed 6 lbs. 11 ozs.

Little tuberculous elevations, pinkish in colour, were scattered thickly all over the surface. On section the organs were almost universally consolidated, and as thickly peppered as possible with very minute whitish foci. Portions of the posterior corners floated in water, but the greater part almost sank.

Trachea.—In the trachea were many scarcely visible colourless elevations (tubercles ?).

Thoracic Glands.—Were much enlarged, their cortices opaque, pinkish or yellowish, and firmer than normal (general tuberculous infiltration).

Heart.—Showed large patches of bright red hæmorrhages on the under surface of the ventricles, chiefly about the interventricular groove. In the right auricle there were several little colourless tubercles on the endocardium, and a few in the right ventricle, but none on the left side.

Abdomen.

Peritoneum.—Showed a few tubercles on the omentum.

Intestines.—Were normal.

Mesenteric Glands.—Were swollen and firmer than normal, but no definite tubercles were seen in them.

Spleen.—Was much swollen, but no definite tubercles could be seen in it.

Liver.—Weighed 4 lbs. 11 ozs. It was large and pale, a pinkish orange in parts, mottled with reddish spots, and with numerous little grey almost invisible tubercles, which were slightly raised. On section it was a brownish orange, and thickly packed with little grey tubercles.

Hepatic Glands.—Were enlarged, and their cortex showed a general tuberculous infiltration, like the thoracic, but not so advanced.

Kidneys.—A moderate number of very minute grey tubercles could with difficulty be made out in each.

Suprarenals.—Contained no visible tubercles.

Renal Glands, Iliac Glands.—Were swollen, and more opaque than normal, and contained more or less definite points or tubercles.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal.—Were all swollen, and more opaque than normal. They resembled the pharyngeal and submaxillary, and all contained more or less definite points or tubercles.

Submaxillary, Parotideal, Post-Pharyngeal.—The post-pharyngeal glands were a little firmer than normal, and showed one or two minute spots, rather more opaque than the rest of the tissue. Similar, but more definitely tuberculous bodies were seen in the submaxillary and parotideal glands.

Hyoid.—The hyoid gland resembled the pharyngeal.

Tongue, Tonsils, Pharynx.—Normal.

Microscopical Examination.

Scraping from Mesenteric Gland.—Tubercle bacilli scanty.

Scraping from Popliteal Gland { (1).—No tubercle bacilli. (2).—Tubercle bacilli.

Scraping from Spleen.—Tubercle bacilli scanty.

CALF 949. (Virus H 49. "T.C.")

Subcutaneous Inoculation of culture derived from Calf 797.

Dose—50 Milligrammes.

Date—November 1st, 1905.

Weight at Inoculation—1 cwt. 0 qrs. 4 lbs. (Age about 10 weeks).

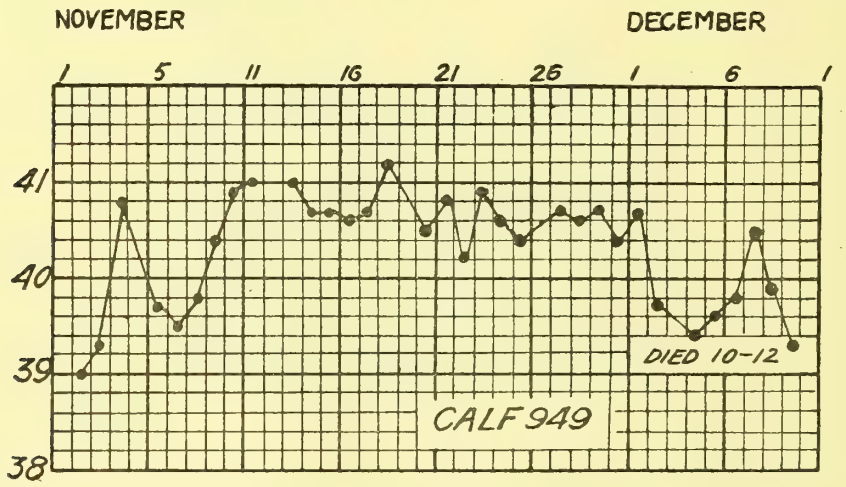
Died—December 10th, 1905. [39 days after inoculation.]

Clinical Notes.

The calf was inoculated on November 1st, 1905. The course of the disease was similar to that usually seen in calves inoculated with 50 milligrammes of a virus of Group I.

The animal died on December 10th, 39 days after inoculation.

Temperature.



Weights.

	cwts.	qrs.	lbs.	
November 1st, 1905 -	1	0	4	Inoculated.
December 10th, 1905-	0	3	14	Died.

Total loss of weight during experiment.—18 lbs.

Average rate of loss per week.—3·2 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Much emaciated.

Local Lesion.—At the seat of injection on the right side of the neck was a large flat solid tumour, which measured $5\frac{3}{4}$ in. by $4\frac{1}{4}$ in. by $1\frac{1}{4}$ in. and weighed 13 ozs. It was dense and fibro-necrotic centrally, and widely infiltrated the skin and subjacent muscle.

Right Prescapular Gland.—Was much enlarged, measured $4\frac{1}{2}$ in. by $2\frac{1}{4}$ in. by $1\frac{3}{4}$ in., and weighed 7 ozs. It was caseo-necrotic throughout.

Left Prescapular Gland.—Contained small caseating tubercles.

Right Prepectoral Gland.—As large as a pigeon's egg, was similar to the right prescapular gland.

Axillary Glands.—Contained small caseating tubercles.

Thorax.

Pleura.—The costal pleura showed a few small tubercles only. The fringes were scarcely at all hypertrophied.

Lungs.—Were voluminous, and weighed 6 lbs. 10 ozs. They were marked by the impression of the ribs. On the surface they were mottled with patches of red or grey, caused largely by more or less confluent small irregularly shaped tubercles. The anterior lobes were almost entirely dark red in colour, and here the tubercles were slightly raised.

Trachea.—There were tubercles in the trachea.

Thoracic Glands.—Were much enlarged, altogether they weighed 5 ozs. They were firm, pinkish grey, and semi-translucent, and infiltrated with a network of caseous striæ.

Heart.—There were several little tubercles visible on the surface of the organ (six on the ventricles and five on the auricles). There were many tubercles of larger size than usual in the endocardium of the right auricle and one in the left auricle.

Abdomen.

Omentum and Peritoneum.—A good many tubercles up to $\frac{1}{8}$ in. in diameter were seen on the omentum.

Small Intestine.—Numerous small caseous tubercles were seen in almost all the Peyer's patches, and here and there a little aggregation of tubercles had commenced to ulcerate.

Large Intestine.—A few tubercles were seen in the cæcum.

Mesenteric Glands.—Contained a moderate number of small irregular caseating tubercles.

Spleen.—Was greatly enlarged and very firm. It weighed 15 ozs. On section it was granular. Every Malpighian body seemed to be the seat of a small opaque tubercle, which was surrounded by dense red tissue.

Liver.—Was large, pale and mottled. The surface was studded with a large number of small grey tubercles, some slightly raised, others seen dimly through a greater or lesser thickness of liver substance. Section showed the organ to be very thickly packed with grey tubercles.

Hepatic Glands.—Were enlarged, and similar in structure (though a little less advanced) to the thoracic.

Kidneys.—Contained numerous small grey tubercles, uniformly distributed throughout the cortex.

Suprarenals.—Contained numerous tubercles.

Renal Glands, Lumbar Glands.—Were enlarged, and similar in structure (though a little less advanced) to the thoracic.

Iliac Glands.—Contained small caseating tubercles.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal.—All contained small caseating tubercles.

Submaxillary, Parotideal, Post-Pharyngeal, Hyoid.—Contained a moderate number of small irregular caseating tubercles.

Tongue.—Normal.

Palate.—Had several tubercles on its dorsal surface.

Tonsils, Larynx.—There were tubercles in the tonsils, in the corrugated mucous membrane descending from the nasal septum, and in the larynx.

Eyes.—One small tubercle was seen in the ciliary process of the choroid of one eye, and two similarly situated in the other.

CALF 929. (Virus H 49. "T.C.")

Subcutaneous Inoculation of culture derived from Calf 797.

Dose—10 milligrammes.

Date—November 1st, 1905.

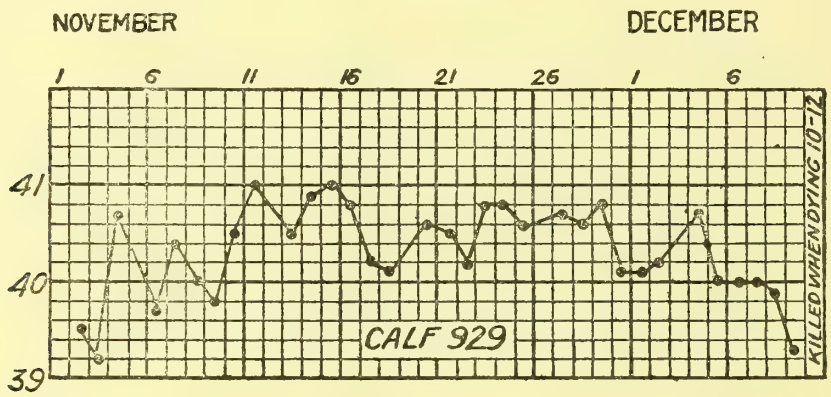
Weight at Inoculation—3 qrs. 21 lbs. (Age about 9 weeks.)

Killed when dying—December 10th, 1905. [39 days after inoculation.]

Clinical Notes.

The calf was inoculated on November 1st, 1905. The temperature rose two days after inoculation, and reached 41·0°C on the 10th day. The animal became very ill, with respiration accelerated. The disease followed the course usually seen in these cases, and the calf was killed when dying on December 10th, 1905, 39 days after inoculation.

Temperature.



Weights.

	cwt.	qrs.	lbs.	
November 1st, 1905 - -	0	3	21	Inoculated.
December 10th, 1905 -	0	3	15	Killed when dying.

Total loss of weight during experiment.—6 lbs.

Average rate of loss per week.—1·1 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Much emaciated.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a huge tumour, which measured 6 in. by 4¾ in. by 2½ in., and weighed 1 lb. 11 ozs.

It was fibro-necrotic centrally, and entirely infiltrated skin and subjacent muscle.

Right Prescapular Gland.—Was much enlarged, and was caseo-necrotic throughout. It measured 4 in by 2½ in. by 2¼ in., and weighed 8 ozs.

Left Prescapular Gland.—Contained many grey tubercles with caseating centres.

Right Prepectoral Gland.—Was much enlarged, and was caseo-necrotic throughout.

Axillary Glands.—Contained many grey tubercles with caseating centres.

Thorax.

Pleura.—There were a few insignificant tubercles on the pleura.

Lungs.—Were voluminous, and weighed 5 lbs. 5 ozs. They were mottled with tubercles, which had greyish red margins, often confluent. The anterior lobes were entirely red and consolidated, and on them the tubercles stood up as greyish white spots. Section showed many small grey tubercles scattered throughout the organ, each surrounded by a narrow dark red zone.

Trachea.—Showed a few tubercles.

Bronchial and other Thoracic Glands.—Much enlarged, and weighed 4 ozs., were composed of grey firm tissue, packed with caseous foci and striæ.

Heart.—Contained several tubercles in the right auricle, and one in the vena cava superior.

Abdomen.

Omentum and Peritoneum.—There were a small number of rather large tubercles on the omentum.

Intestines.—A few small tubercles were sparsely scattered throughout the small and large intestines.

Mesenteric Glands.—Contained many irregular grey tubercles with caseating centres.

Spleen.—Was very large, and weighed 14 ozs. On section it was very coarsely granular and very firm. Every Malpighian body seemed the seat of a small yellowish focus surrounded by a thick layer of dense dark red tissue.

Liver.—The liver was pale, but not large. On its surface a great number of large pale grey tubercles were visible; these were peculiar in presenting an indefinite paler margin, though not actually on the surface. Section showed the organ to contain numerous small pale tubercles.

Hepatic Glands.—The hepatic glands were moderately enlarged, and their cortices were packed with grey tubercles with caseating centres.

Kidneys.—The kidneys showed only a moderate number of pale grey tubercles on their surfaces and on section.

Suprarenals.—Both contained small grey tubercles.

Iliac Glands.—Contained many grey tubercles with caseating centres.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal.—Contained many grey tubercles with caseating centres.

Submaxillary, Parotideal, Post-Pharyngeal, Hyoid.—Contained many irregular grey tubercles with caseating centres.

Tongue, Palate.—Normal.

Tonsils.—In each tonsil a small caseating tubercle was found.

Eyes.—Normal.

CALF 933. (Virus H 49. "T.C.")

Subcutaneous Inoculation of culture derived from Calf 797.

Dose—10 milligrammes.

Date—November 1st, 1905.

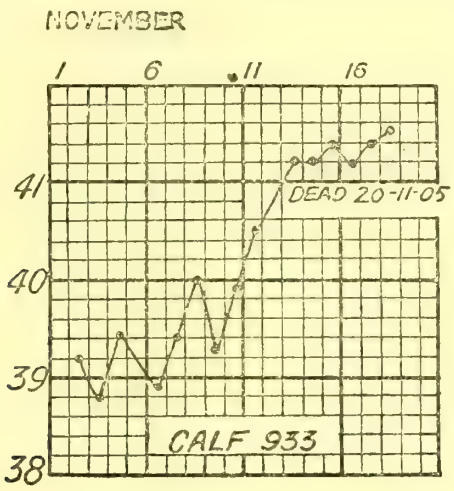
Weight at Inoculation—1 cwt. 0 qr. 3 lbs. (Age about 10 weeks.)

Died—November 20th, 1905. [19 days after inoculation.]

Clinical Notes.

The calf was inoculated on November 1st, 1905. The temperature quickly rose, reaching 41·2°C. on the 12th day, and the animal became very ill; the disease progressed with exceptional rapidity, and the calf died on November 20th, 1905, 19 days after inoculation.

Temperature.



Weights.

	cwts.	qrs.	lbs.	
November 1st, 1905 - -	1	0	3	Inoculated.
November 20th, 1905 -	1	0	8	Died.

Total gain of weight during experiment.—5 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—The general condition of the animal was good, there not having been, I suppose, time for emaciation.

Local Lesion.—At the seat of injection on the right side of the neck was a solid flat tumour, which measured 7 in. by 3 in. by 1½ in., and weighed 12 ozs. It was firm and caseo-necrotic, and was very closely incorporated with skin and subjacent muscle, but only slightly infiltrated these structures.

Right Prescapular Gland.—Measured 3¼ in. by 2 in. by 1 in., and weighed 2 ozs. It was caseo-necrotic, but still rather soft.

Left Prescapular Gland.—Swollen and congested, firmer and more opaque than normal. The cortex appeared to have undergone a general tuberculous infiltration, and many little grey tubercles were also visible.

Right Prepectoral Gland.—Was similar in structure to the right prescapular gland, and as large as a small cherry.

Axillary Glands.—Swollen and congested, and firmer and more opaque than normal, resembling the left prescapular. Many little grey tubercles were visible in them.

Thorax.

Pleura.—The costal pleura was congested, and showed hypertrophy of the fringes along the margins of the ribs, and here and there a little tubercle.

Lungs.—The lungs weighed 4 lbs. 12 ozs. They were red, heavy, and soft. On the anterior parts, which were softer, the surface was mottled, with many pale spots of very various size, but for the most part extremely small, and which appeared to be tubercles. Section showed the lungs to be almost airless, being very moist and congested. The right was a dark reddish purple, the left paler. Both lungs were everywhere very thickly peppered with extremely minute whitish grey tubercles.

Portions of the lung from many different parts sank in water, only the posterior corners and the thin margin of the left contained enough air to float them. The bronchi were very full of a turbid liquid, which ran out of the trachea in considerable quantity when the lung was pressed.

Trachea.—In the trachea were numerous tubercles, very minute, and each surrounded by a zone of congestion.

Thoracic Glands.—Were much swollen, the medulla intensely congested, and the cortex opaque and firmer than normal (general tuberculous infiltration). There were no individual tubercles seen.

Heart.—The surface of the heart was bright red in patches, caused probably by subserous hæmorrhages, particularly about the interventicular groove.

A few small rather opaque tubercles were seen in the endocardium of the right auricle and ventricle.

Abdomen.

Omentum and Peritoneum.—There were a number of small tubercles on the omentum.

Intestines.—Appeared fairly normal, but showed a congestion of the finer vessels, and were rather soft.

Mesenteric Glands.—Were swollen and opaque, the cortex had undergone a general tuberculous infiltration, similar to, but not quite so advanced as in the thoracic glands.

Spleen.—Was large, but did not contain visible tubercles.

Liver.—The liver was very large (5 lbs. 8 ozs.) and pale, and thickly peppered with pale grey tubercles of various sizes, but mostly very small, and not in the least raised above the surface. Section showed a very fine lobular pale network throughout the organ, and this obscure the little tubercles, which could rarely be made out.

Hepatic Glands.—Were enlarged, and their cortex was cream coloured (general tuberculous infiltration as in the thoracic glands).

Kidneys —Both kidneys showed on the surface a fine pale (lobular ?) mottling, and were congested. Only here and there an occasional tubercle could be seen.

Suprarenals.—Were pale and rather opaque, but they were not swollen, and contained no visible tubercles.

Renal Glands, Lumbar Glands, Iliac Glands—These glands were swollen and congested, and some of them were firmer and more opaque than normal, resembling the mesenteric. In all many little grey tubercles were visible.

Genito-Urinary System.

Testes.—Appeared normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal.—These glands were swollen and congested, and some of them were firmer and more opaque than normal, resembling the mesenteric. In all many little grey tubercles were visible.

Tongue.—On the right side of the under part of the tongue were many little pale points (tubercles ?).

Palate.—The upper surface of the palate showed swollen follicles but no tubercles.

Tonsils, Larynx.—Appeared normal.

Microscopical Examination.

Scraping from Spleen.—Tubercle bacilli scanty.

Scraping from Kidney.—Tubercle bacilli.

Scraping from Tongue.—Three tubercle bacilli seen.

Scraping from Liver Substance { (1). No tubercle bacilli seen. (2). Tubercle bacilli scanty.

CALF 1097. (Virus H 49. "T.C.")

Subcutaneous Inoculation of culture derived from human mesenteric glands.

Dose—50 milligrammes.

Date—May 25th, 1906.

Weight at Inoculation—1 cwt. 0 qr. 8 lbs. (Age about 11 weeks.)

Killed—August 22nd, 1906. (89 days after inoculation.)

Clinical History.

The calf was inoculated on May 25th, 1906. During the second and third weeks after inoculation it suffered from the constitutional disturbance commonly noticed in calves injected with viruses of Group II., and the temperature was high during this period. It quickly recovered, and remained well until killed on August 22nd, 89 days after inoculation.

Temperature.

On the fourth day after inoculation the temperature rose and continued high till the tenth day, when it reached its maximum point 40·8°. It then fell gradually, becoming normal about a month after the commencement of the experiment.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—At the seat of inoculation on the right side of the neck was a small swelling, measuring $3\frac{3}{4}$ in. by 3 in. by $1\frac{3}{4}$ in.

It was composed of a caseo-necrotic mass, commencing to soften in its centre. It did not infiltrate the skin, and on its under surface it was limited, and separated from the subjacent muscle by a layer of dense pearly white fibrous tissue.

The Right Prescapular Gland.—Was slightly enlarged, and measured $2\frac{3}{4}$ in. by $1\frac{1}{8}$ in. by $\frac{3}{4}$ in. It contained several large caseo-calcareous nodules.

The Right Prepectoral Gland.—Was as large as a pea, and was entirely caseo-calcareous.

The Left Prescapular and Axillary Glands.—Were normal.

Thorax.

The Pleura.—Was normal.

The Lungs.—Contracted well. They weighed 1 lb. 7 ozs., and were normal throughout.

Thoracic Glands.—Normal.

Heart.—Normal.

Abdomen.

Omentum and Peritoneum.—Normal.

Intestines.—Normal.

Mesenteric Glands.—Normal.

Spleen.—Normal. It weighed no more than 4 ozs.

Liver.—Normal.

Portal Glands.—Normal.

Kidneys.—In the right was a little tubercle about 1 mm. in diameter. The left was normal.

Suprarenals.—Normal.

Renal, Lumbar, and Iliac Glands.—Normal.

Tongue, Pharynx, Palate, Tonsils.—Normal.

Eyes.—Normal.

Testes.—Normal.

Various Lymphatic Glands.

Precrural and Popliteal.—Normal.

Gluteal and Ischiatic.—Normal.

Pubic.—Normal.

Posterior-Pharyngeal and Hyoid.—Normal.

Submaxillary and Subparotid.—Normal.

VIRUS H 50. "P.H."

LUNG. (Post-mortem.)

TABLE 50.

VIRUS H 50. "P.H.

CULTURE INOCULATION.

June 20, 1905.

Strain derived from human lung, through G.P. 1490.

Total duration of artificial cultivation 3 months.

4th subculture used for injection, 21 days old, on pure serum.



BULL-CALF 829.

Subcutaneous.

Dose: 50 mg.

Killed, October 10, 1905.

112 days.

P.M.—Fibrous-walled tumour with softened contents. Fibro-calcareous nodules in nearest glands. **(L.T.)**

RABBITS.

480	50 mg.	Killed	112 days	Almost nil.
481	10 „	Died	25 „	Tuberculous peritonitis, rather severe.
482	1· „	Killed	112 „	Trace of tuberculosis in peritoneum and left kidney.
483	0·1 „	Died	4 „	No tuberculosis.

GUINEA-PIGS.

1572	1·0 mg.	Died	21 days	G.T.
1573	1·0 „	„	23 „	„
1574	0·1 „	„	23 „	„
1575	0·1 „	„	27 „	„

RAT (P.)

40	Died 87 days	General dissemination of tubercle bacilli.



BULL-CALF 843.

Subcutaneous.

Dose: 50 mg.

Killed, October 10, 1905.

112 days.

P.M.—Fibrous-walled tumour with softened contents. Prescapular gland partly caseo-necrotic, partly calcareous. Some minute foci seen in lungs and liver. A few calcareous foci in mesenteric glands. **(S.T.)**

VIRUS H 50. "P.H."

CULTURE INOCULATION.

June 27, 1906.

Strain derived from human lung, through G.P. 1490.

It was raised on March 27, 1905, and has therefore been 15 months in cultivation.

The 12th generation of culture was used for injection, 22 days old, on pure bovine serum.

PIG 45.

Subcutaneous.

Dose : 50 mg.

Killed, September 27, 1906.

92 days.

P.M.—Minimal lesion at seat of inoculation. Nearest glands slightly affected. One caseous focus in lung. **(S.T.)**

PIG 49.

Subcutaneous.

Dose : 50 mg.

Killed, September 27, 1906.

92 days.

P.M.—Minimal lesion at seat of inoculation. Softened caseous nodules in nearest glands. Moderate number of grey tubercles with minute softened centres in lungs. **(S.T.)**

RABBIT 918.

Intraperitoneal.

Dose : 10 mg.

Killed : 93 days.

P.M.—Slight tuberculosis of peritoneum and lungs. Kidneys more severely affected.

PIG 53.

Fed.

Dose : 50 mg.

Killed, September 28, 1906.

93 days.

P.M.—Alimentary tract normal. A single caseous tubercle in lung, and a nodule with softened contents (? tuberculous) in the liver.

PIG 55.

Fed.

Dose : 50 mg.

Killed, September 27, 1906.

92 days.

P.M.—No tuberculosis.

VIRUS H 50. "P.H."

P.H., Male, Aged Thirty-four, Admitted to Hospital on February 7th, 1905, Suffering from Phthisis. Died on February 20th, 1905.

Family History.—Unknown.

Clinical History.—No reliable information could be obtained of the patient's previous history. He stated that he had been well up to within two months of entering the hospital.

On admission signs of extensive disease of the left lung were found. The temperature varied between 99° and 101° F.

The patient got rapidly worse, and died about a fortnight afterwards.

POST-MORTEM EXAMINATION.

Thorax.

Lungs.—The left pleura was closely adherent to the diaphragm, and slightly, at the apex, to the thoracic wall. There was a small amount of fluid in the left pleural cavity. The left lung was collapsed, and contained a cavity opening into the pleura. The surface of the lung showed numerous hard nodules. The right lung was much congested, but was apparently not tuberculous.

Bronchial Glands.—Deeply pigmented, and contained some greyish yellow foci.

Abdomen.

Peritoneum, Intestines and Mesenteric Glands.—Were normal.

Liver.—Was enlarged and fatty.

Spleen.—Was enlarged and soft.

Kidneys.—Both organs were enlarged and granular.

There were no scars in the neck, and the *Bones* and *Joints* were healthy.

DESCRIPTION OF MATERIAL RECEIVED AT BLYTHWOOD.

A Left Lung.—The lung was collapsed, with recent lymph on the diaphragmatic pleura. On the external surface, about three inches from the apex, was a semilunar opening about half an inch long, having sharply defined edges. This opening, which had the appearance of having been made with a scalpel, opened obliquely into a ragged cavity, containing brown turbid fluid. There was no lymph in the neighbourhood of the opening.

On section the lung contained numerous grey tubercles and patches of various sizes, and the lung tissue was full of thick brown turbid fluid.

Microscopical Examination.

Fluid Issuing from the Opening in the Lung.—Tubercle bacilli fairly numerous, some very short, many long. The fluid also contained a large mass of long bacilli (not tubercle) and other micro-organisms.

Separate Emulsions made from grey nodules from upper part of Lung, and also from the lower.—Both contained tubercle bacilli in small numbers.

Emulsion of contents and scrapings from the lung cavity.—Showed fairly numerous tubercle bacilli.

CALF 829. (Virus H 50. "P.H.")

Subcutaneous Inoculation of culture from human lung, through Guinea-Pig 1490.

Dose—50 milligrammes.

Date—June 20th, 1905.

Weight at inoculation—1 cwt. 0 qrs. 12 lbs.

Killed—October 10th, 1905. [112 days after inoculation.]

Clinical Notes.

The calf was inoculated on June 20th, 1905. The development of the tumour at the seat of inoculation, and of the nearest lymphatic gland, was similar to that usually seen in calves inoculated with 50 milligrammes of a virus of Group II. The calf remained well, and was killed on October 10th, 1905, 112 days after inoculation.

Temperature.

With the exception of a very slight and transient rise at the commencement of the experiment, the temperature remained normal throughout.

Weights.

The calf gained weight normally during the experiment.

	cwts.	qrs.	lbs.	
June 20th, 1905 - - -	1	0	12	Inoculated.
October 10th, 1905 - -	1	3	2	Killed.

Total gain of weight during experiment.—2 qrs. 18 lbs.

Average rate of gain per week.—4·3 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—At the seat of inoculation was a small prominent swelling 2 in. by 1½ in. by 1 in.; it consisted of a fibrous-walled cavity, with calcareous grains, enclosing softened caseous débris.

Right Prescapular Gland.—Was slightly enlarged. It contained a large fibrous-calcareous nodule, almost an inch in long diameter.

Left Prescapular Gland.—Normal.

Right Prepectoral Gland.—Contained a pea-sized nodule of similar structure to that in the right prescapular.

Axillary Glands.—Normal.

Thorax.

Pleura, Lungs, Thoracic Glands, Heart.—Normal.

Abdomen.

Peritoneum, Intestines, Mesenteric Glands, Spleen, Liver, Portal Glands, Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Posterior Pharyngeal, Hyoid.—Normal.

Tonsils, Pharynx.—Normal

CALF 843. (Virus H 50. "P.H.")

Subcutaneous Inoculation of culture derived from human lung, through Guinea-Pig 1490.

Dose—50 milligrammes.

Date—June 20th, 1905.

Weight at inoculation—1 cwt. 0 qr. 5 lbs.

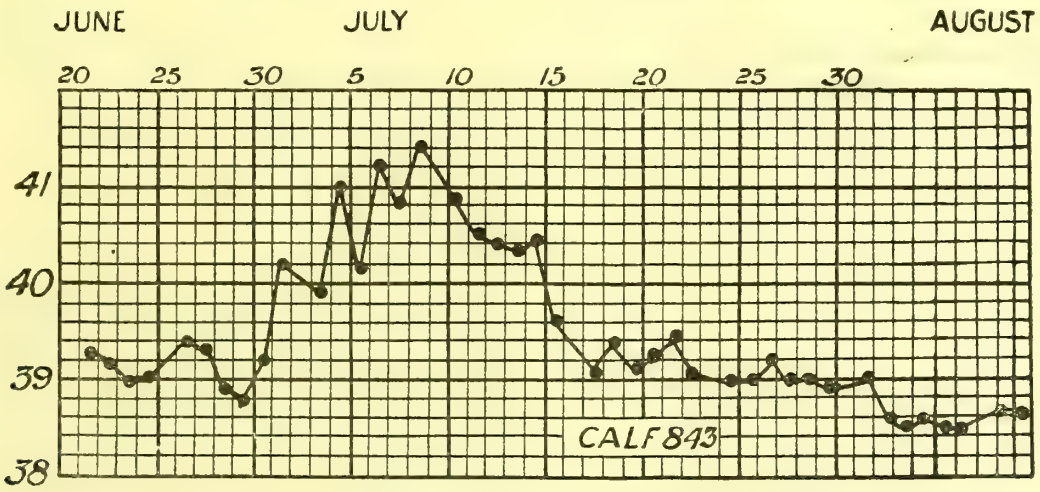
Killed—October 10th, 1905. [112 days after inoculation.]

Clinical Notes.

The calf was inoculated on June 20th, 1905. The development of the tumour at the seat of inoculation, and of the nearest lymphatic gland, was similar to that usually seen in calves inoculated with 50 milligrammes of a virus of Group II.

The calf suffered from the constitutional disturbance following inoculation, which commonly occurs in these cases, but soon recovered, and was in good health for two months previous to death.

Temperature.



From August 8th to October 10th, when the calf was killed, the temperature remained normal.

Weights

The calf gained very little in weight during the experiment.

	cwts.	qrs.	lbs.	
June 20th, 1905	1	0	5	Inoculated.
October 10th, 1905	1	0	22	Killed.

Total gain of weight during experiment.—17 lbs.

Average rate of gain per week.—1 lb.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—There was a prominent fluctuating tumour at the seat of inoculation, which measured 6½ in. by 3¾ in. by 3 in. It consisted of a fibrous wall, containing at one end some calcareous grains, and filled with fluid caseous contents.

Right Prescapular Gland.—Was moderately enlarged, and partly dense, salmon pink, and caseo-necrotic, partly softer and calcareous.

Left Prescapular Gland, Right Prepectoral Gland, Axillary Glands.—Normal.

Thorax.

Pleura.—Normal.

Lungs.—At first sight were normal, but showed on close inspection a moderate number (twelve or more on the surface of the right) of tiny translucent bodies, with minute opaque centres.

Thoracic Glands, Heart.—Were normal.

Abdomen.

Small Intestine.—In some of the Peyer's patches of the small intestine were a few small foci.

Mesenteric Glands.—In the mesenteric glands five small calcareous tubercles were found.

Spleen.—Normal.

Liver.—On close inspection the liver was seen to be sparsely peppered with very minute pale foci over its diaphragmatic surface. These could also be seen more or less clearly on section. The larger ones, when picked out on the point of a knife, were spherical and translucent, and when crushed seemed to be fibrous, and were neither caseous nor gritty.

Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Posterior Pharyngeal, Hyoid.—Normal.

Pharynx.—Normal.

Microscopical Examination.

Foci from Intestine (Two films examined).—No tubercle bacilli seen.

Calcareous Tubercles from Mesenteric Gland (Two films examined).—No tubercle bacilli seen.

Translucent Foci from Liver (Two films examined.)—No tubercle bacilli seen.

PIG 45. (Virus H 50. "P.H.")

Subcutaneous Inoculation of culture derived from human lung, through G.P. 1490.

Dose—50 milligrammes.

Date of Inoculation—June 27th, 1906.

Killed when in Good Health—September 27th, 1906. [92 days after inoculation.]

Weights.

	qrs.	lbs.
June 27th, 1906	2	3
September 27th, 1906	3	2

Total gain of weight.—27 lbs.

Rate of gain per week.—2 lbs.

POST-MORTEM EXAMINATION.

General Condition.—Fat.

At the Seat of Inoculation.—On the right side of the abdominal wall was a slight thickening of the skin, but no definite scar. In the subcutaneous tissue were a few small tubercles with soft caseous centres.

The nearest Precrural Gland.—Was normal.

The nearest Pubic Gland.—Contained four little tubercles, each with a minute softened centre.

Abdomen.

Peritoneum and Omentum.—Normal.

Intestines.—Normal.

Mesenteric Glands.—Normal.

Spleen.—Normal.

Liver.—Normal.

Hepatic Glands.—Normal.

Kidneys.—Normal.

Suprarenals.—Normal.

Renal, Lumbar, and Iliac Glands.—Normal.

Testes.—Normal.

Thorax.

Pleura.—Normal.

Heart.—Normal.

Lungs.—Along the anterior and inferior margins of the anterior lobes and the inner dorsal margins of the posterior lobes was a more or less continuous tract of dense consolidated lung, fibrous, pinkish grey, and translucent.

In the anterior part of the right posterior lobe was a group of irregular little nodules of the same kind.

These lesions did not appear to be tuberculous, they resembled rather the carnified lobules often seen in the calf. On section they were of a uniform pinkish grey colour, the little bronchi alone appearing different from the rest of the tissue. The absence of caseous foci contrasted with their presence in the tubercles of Pig 49.

In one of these masses an irregular elongated caseous focus was found, containing tubercle bacilli.

Bronchial and other Thoracic Glands.—Normal.

Pharynx, Palate, Trachea.—Normal.

Various Lymphatic Glands.

Prescapular, Axillary, Left Precrural.—Normal.

Submaxillary, Hyoid, and Parotideal.—Normal.

Microscopical Examination.

Caseous Matter from Lung Tubercle.—Tubercle bacilli.

PIG 49. (Virus H 50. "P.H.")

Subcutaneous Inoculation of culture derived from human lung, through G.P. 1490.

Dose—50 milligrammes.

Date of Inoculation—June 27th, 1906.

Killed when in Good Health—September 27th, 1906. [92 days after inoculation.]

Weights.

	qrs.	lbs.
June 27th, 1906	2	2
September 27th, 1906	3	9

Total gain of weight.—1 qr. 7 lbs.

Rate of gain per week.—2·7 lbs.

POST-MORTEM EXAMINATION.

General Condition.—Fat.

At the Seat of Inoculation.—On the right side of the abdominal wall there was no definite scar, but there was a small fibrous nodule containing a few yellow points under the skin; and in the subcutaneous tissue beneath were about half a dozen shot-sized tubercles with softened yellow centres.

The nearest Precrural Gland.—Contained a small caseous and softened focus.

The Pubic Gland.—On the same side was enlarged, and contained a softened caseous nodule about 3¼ in. in diameter, as well as several small tubercles.

Abdomen.

Omentum and Peritoneum.—Normal.

Intestines.—Normal.

Mesenteric Glands.—Normal.

Liver.—The liver contained three whitish foci with minute pultaceous centres.

Hepatic Glands.—Normal.

Spleen.—Normal.

Kidneys.—Normal.

Suprarenals.—Normal.

Testes.—Normal.

Renal, Lumbar, and Iliac Glands.—Normal.

Thorax.

Pleura.—Normal.

The Lungs.—Contracted well. They showed on their surfaces a moderate number of little tubercles, the largest about 2 mm. in diameter, grey and translucent, with relatively small softened centres. A few similar tubercles were seen on section.

The Bronchial and other Thoracic Glands.—Were normal.

Heart.—Normal.

Tongue, Pharynx, Trachea.—Normal.

There was an abscess in the *left ear*, due to the button which had been inserted in it. The gland at its root was enlarged.

Various Lymphatic Glands.

Prescapular and Axillary.—Normal.

Left Precrural and Left Pubic.—Normal.

Submaxillary and Hyoid.—Normal.

Microscopical Examination.

Tubercle from Lung.—One tubercle bacillus seen.

Focus from Liver.—No tubercle bacilli.

PIG 53. (Virus H 50. "P.H.")

Fed with Culture—Derived from human lung, through G.P. 1490.

Dose—50 milligrammes.

Date of Inoculation—June 27th, 1906.

Killed when in Good Health—September 28th, 1906. [93 days after inoculation.]

Weights.

	qrs.	lbs.
June 27th, 1906 - - - -	1	18
September 28th, 1906 - - -	2	18

Total gain of weight.—1 qr.

Rate of gain per week.—2·1 lbs.

POST-MORTEM EXAMINATION.

General Condition.—Fat.

Alimentary Tract.

Tongue, Pharynx, Palate.—Normal.

Submaxillary, Posterior-pharyngeal, and Hyoid Glands.—Normal.

Cervical Glands.—Normal.

Intestines.—Normal.

Mesenteric Glands.—Normal.

Abdomen.

Omentum and Peritoneum.—Normal.

Liver.—In the substance of the liver, under the capsule, there was a nodule about 5 mm. in diameter, with a thin fibrous wall, and purulent contents. With this exception the liver was normal.

Portal Glands.—Normal.

Spleen.—Normal.

Kidneys.—Normal.

Suprarenals.—Normal.

Iliac and Lumbar Glands.—Normal.

Thorax.

Pleura.—Normal.

Lungs.—In the thin margin of the left caudal lobe, just under the pleura, there was a hemp-seed sized nodule with a thin fibrous capsule and soft, caseous, slightly gritty contents.

There were besides two or three grey translucent parasitic nodules, the largest the size of a hemp-seed. The lobules at the posterior tip of the caudal lobes were firmer than normal and showed numbers of minute grey translucent foci; in the bronchi leading to these lobules several filariæ were found.

Thoracic Glands.—Normal.

Heart.—Normal.

Various Lymphatic Glands.

Prescapular, Axillary, Precrural, Popliteal.—Normal.

Microscopic Examination.

Caseous Tubercle from Lung.—Tubercle bacilli.

Contents of Nodule from Liver.—No tubercle bacilli.

PIG 55. (Virus H 50. "P.H.")

Fed with Culture—Derived from human lung, through G.P. 1490.

Dose—50 milligrammes.

Date of Inoculation—June 27th, 1903.

Killed when in Good Health—September 27th, 1906. [92 days after inoculation.]

Weights.

	qrs.	lbs.
June 27th, 1906 - - - -	1	24
eptember 27th, 1906 - - -	3	7

Total gain of weight.—1 qr. 11 lbs.

Rate of gain per week.—3 lbs.

POST-MORTEM EXAMINATION.

General Condition.—Fat.

Alimentary Tract.

Tongue, Pharynx, Palate.—Normal.

Posterior-pharyngeal, Submaxillary, and Hyoid Glands.—Normal.

Cervical Glands.—Normal.

Intestines.—Normal.

Mesenteric Glands.—Normal.

Abdomen.

Omentum and Peritoneum.—Normal.

Liver.—Normal.

Portal Glands.—Normal.

Spleen.—Normal.

Kidneys.—Normal.

Suprarenals.—Normal

Renal, Lumbar, and Iliac Glands.—Normal.

Thorax.

Pleura.—Normal.

Lungs.—In each lung was a single fibrous shot-sized grey body without central opacity. These resembled the little irregular grey nodules without opaque or caseous centres in the lung of Pig 45.

Thoracic Glands.—Normal.

Heart.—Normal.

Various Lymphatic Glands.

Prescapular, Axillary, Precrural, Popliteal.—Normal.

Microscopic Examination.

Scraping from Apparently Normal Mesenteric Gland.—No tubercle bacilli.

Focus from Lung.—No tubercle bacilli.

VIRUS H 51. "H. M."

LUNG. (Post-mortem.)

VIRUS H 51. "H.M."

CULTURE INOCULATIONS.

(I.) LUNG.

August 26, 1905.

Strain derived from human lung, direct.

Total duration of artificial cultivation : 3 months.

Culture used for injection : 3rd, 21 days old, on pure bovine serum.



BULL-CALF 833.

Subcutaneous.

Dose : 50 mg.

Killed : November 11, 1905.

77 days.

P.M.—Thin-walled abscess-cavity at seat of inoculation. Caseo-calcareous nodule in prescapular gland. A few minute tubercles in suprarenals. (S.T.)

RABBIT.

554	1· mg.	Killed, 77 days	Trace of tuberculosis in peritoneum, lungs, and kidneys.

(II.) LUNG.

October 3, 1905.

Strain derived from human lung, direct.

Total duration of artificial cultivation : 4 months.

Culture used for injection : 5th, 21 days old, on pure bovine serum.



COW-CALF 907.

Subcutaneous.

Dose : 50 mg.

Killed : January 2, 1906.

91 days.

P.M. — Fibrous-walled abscess at seat of inoculation. Caseo-necrotic nodules in nearest glands. A single glassy focus in lung. (S.T.)

RABBITS.

631	10 mg.	Killed, 136 days	Widespread tuberculosis of a somewhat unusual type.
632	1· mg.	„ 136 „	Slight tuberculosis of lungs. Trace in peritoneum and kidneys.
633	1· mg.	„ 136 „	Slight tuberculosis of lungs. Trace in omentum.
634	0·1 mg.	„ 136 „	„ „ „

GUINEA-PIGS.

1734	1· mg.	Died, 14 days	G.T.
1735	1· mg.	„ 15 „	G.T.
1736	0·1 mg.	„ 14 „	Early T.
1737	0·1 mg.	„ 15 „	G.T.

VIRUS H 51. "H.M."

H.M., a Male, Aged 28, Admitted to Hospital on May 26th, 1905, suffering from Acute Tuberculosis. Died on May 29th, 1905.

Family History.—The patient stated that his mother had died of consumption.

Clinical History.—The patient had been weak and suffering from shortness of breath for some weeks, but had been much worse since May 22nd, four days before coming to hospital. He had a cough, with mucous expectoration. He stated that he had had a similar illness in August, 1903, and was then told that his "lungs were affected."

On admission he was found to have signs of phthisis at both apices, the disease being more advanced in the right than in the left lung. His condition immediately became worse. He became very cyanosed, and the temperature varied between 100° and 104°. There was a trace of albumen in the urine.

On May 29th, three days after admission, he became comatose, and died.

POST-MORTEM EXAMINATION.

No scars were seen in the neck.

Thorax.

Lungs.—The right lung contained a cavity in the apex, which extended into the lower lobe. The whole of the lung showed evidence of miliary tubercle. No cavity was found in the left lung, but its tissue was much solidified, and contained numerous small miliary tubercles.

Bronchial Glands.—Enlarged, but not obviously tuberculous.

Abdomen.

Peritoneum.—Normal.

Intestines.—Normal.

Mesenteric Glands.—Normal.

Liver.—Enlarged and fatty, and showed one or two small tubercles on the surface.

Spleen.—Was congested, but showed no evidence of tubercle.

Kidneys.—Showed a few small tubercles on the surface.

Meninges of Brain.—Were examined, and found to be normal.

Bones.—Healthy.

Joints.—Healthy.

DESCRIPTION OF MATERIAL RECEIVED AT BLYTHWOOD.

Right Lung.—Extending from the apex downwards for a distance of about 4 in. the lung was riddled with irregular cavities. The rest of the lung was uniformly and thickly peppered with early miliary tubercles. The miliary tubercles in the upper lobes were larger and whiter than those in the anterior half of the lung.

Microscopical Examination.

An emulsion of the portion of the lung containing miliary tubercles was made, and on examination was found to contain very few tubercle bacilli.

CALF 833. (Virus H 51. "H.M.")

Subcutaneous Inoculation of culture derived from human lung.

Dose—50 milligrammes.

Date—August 26th, 1905.

Weight at Inoculation—1 cwt. 0 qr. 24 lbs.

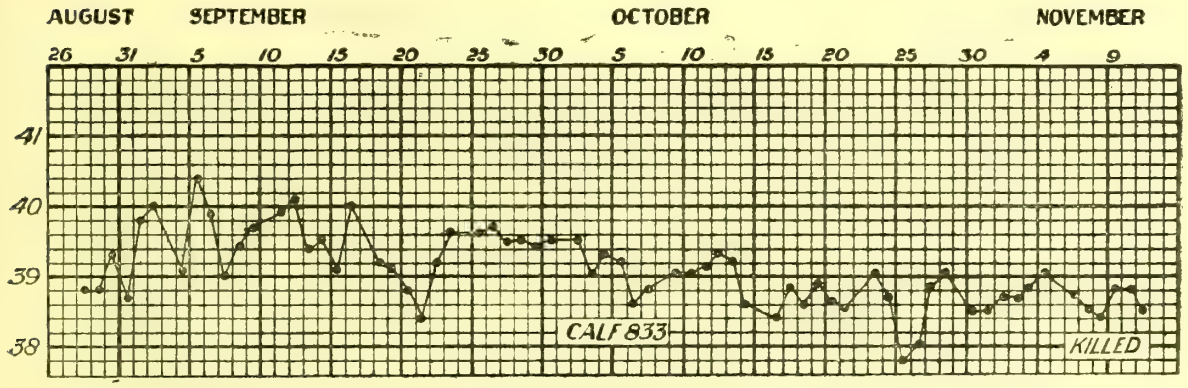
Killed—November 11th, 1905. 77 days after inoculation.

Clinical Notes.

The calf was inoculated on August 26th, 1905. The development of the tumour at the seat of inoculation and of the nearest lymphatic gland was similar to that usually seen in calves inoculated with 50 milligrammes of a virus of Group II.

The calf was killed on November 11th, 77 days after inoculation. Except for a slight constitutional disturbance immediately following the inoculation, it remained well during the experiment.

Temperature.



Weight.

The increase in weight during the experiment was but little below the normal.

	cwts.	qrs.	lbs.	
August 26th, 1905 - -	1	0	24	Inoculated.
November 11th, 1905 - -	1	2	0	Killed.

Total gain of weight during experiment.—32 lbs.

Average rate of gain per week.—3 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a prominent tumour, which measured 3½ in. by 3 in. by 1¾ in. It contained thin fluid, with curdy débris, enclosed in a thin fibrous-walled cavity.

Right Prescapular Gland.—Was slightly enlarged, and contained a caseo-calcareous nodule as large as a small bean.

Left Prescapular Gland, Right Prepectoral Gland, Axillary Glands.—Normal.

Thorax.

Pleura.—Normal.

Lungs.—The lungs looked healthy. On the diaphragmatic surface of the right was a little area of carnification, in which the little bronchi were dilated. Elsewhere many minute grey specks became apparent when the lung had become a little dry. They had no opaque centres, and were far too minute to be picked out on the point of a knife.

Trachea.—Normal.

Thoracic Glands, Heart.—Normal.

Abdomen.

Peritoneum, Intestines, Mesenteric Glands, Spleen, Liver, Hepatic Glands, Kidneys.—Normal.

Suprarenals.—The left contained six minute tubercles, and the right one.

Renal Glands, Lumbar Glands, Iliac Glands—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Pharyngeal, Hyoid.—Normal.

Tongue, Tonsils, Pharynx, Larynx.—Normal.

Microscopical Examination.

Carnified Area in Lung (general scraping, including chiefly the contents of the bronchi).—Tubercle bacilli few.

Scraping from Lung with grey specks.—No tubercle bacilli.

Scraping from Spleen.—No tubercle bacilli.

Scraping from Iliac Gland.—No tubercle bacilli.

Scraping from Left Popliteal Gland.—No tubercle bacilli.

Tubercle from Left Suprarenal.—Tubercle bacilli fairly numerous.

CALF 907. (Virus H 51. "H.M.")

Subcutaneous Inoculation of culture derived from human lung.

Dose—50 milligrammes.

Date—October 3rd, 1905.

Weight at Inoculation—1 cwt. 0 qr. 7 lbs.

Killed—January 2nd, 1906. [91 days after inoculation.]

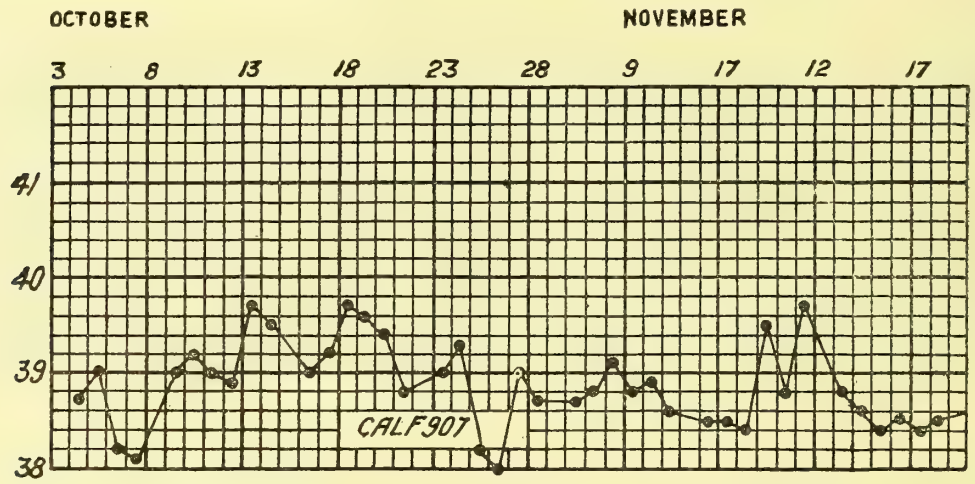
Clinical Notes.

The calf was inoculated on 3rd October, 1905.

The development of the tumour at the seat of inoculation and of the nearest lymphatic gland, was similar to that usually seen in calves inoculated with fifty milligrammes of a virus of Group II.

The calf was killed on January 2nd, 1906, ninety-one days after inoculation. It remained in good health during the experiment, but the rate of growth was slow.

Temperature.



After November 17th the temperature remained practically normal.

Weights.

	cwts.	qrs.	lbs.	
October 3rd, 1905 - - -	1	0	7	Inoculated.
January 2nd, 1906 - - -	1	0	27	Killed.

Total gain of weight during experiment.—20 lbs.

Average rate of gain per week.—1·5 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—At the seat of inoculation on the right side of the neck was a prominent swelling, which consisted of a fibrous cyst with ragged caseous lining, filled with serous fluid containing flakes of caseous débris.

Right Prescapular Gland.—Was moderately enlarged and almost entirely consisted of two large dense salmon pink caseo-necrotic masses, with calcareous periphery.

Left Prescapular Gland.—Normal.

Prepectoral Glands.—The right prepectoral gland was as large as a pea, and similar in structure to the right prescapular.

Axillary Glands.—Normal.

Thorax.

Pleura.—Normal.

Lungs.—Were normal, except for a single glassy focus which could be picked out on the point of a knife, and which was about the size of a mustard seed.

Thoracic Glands, Heart.—Normal.

Abdomen.

Peritoneum, Omentum, Intestines, Mesenteric Glands, Spleen, Liver, Hepatic Glands, Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Udder, Supramammary Glands.—Normal.

Special Glands.

Precrural, Gluteal, Ischiatic, Popliteal, Submaxillary-Parotideal, Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

VIRUS H 52. "T.F."

LUNG. (Post-mortem.)

VIRUS H. 52. "T.F."

LUNG.

CULTURE INOCULATION.

September 8, 1905.

Strain derived from human lung, through G.P. 1,565.

Total duration of artificial cultivation, 2 months.

Subculture used for injection, 21 days old, on pure bovine serum.



BULL-CALF 903.

Subcutaneous.

Dose : 150 mg.

Killed, December 7, 1905.

90 days.

P.M.—Dense fibrous lesion at seat of inoculation. Nearest glands contain caseo-calcareous nodules (L.T.)

RABBITS.

615	10 mg.	D. 18 days	G.T.
616	1· mg.	„ 2 „	Psorospermosis.
617	1· mg.	„ 33 „	Slight tuberculous peritonitis One tubercle in left kidney.
618	0·1 mg.	K. 91 „	Trace of tuberculosis in peritoneum and kidneys.

GUNIEA-PIGS.

1,719	1· mg.	D. 12 days	G.T.
1,720	1· mg.	„ 14 „	„
1,721	0·1 mg.	„ 14 „	„
1,722	0·1 mg.	„ 23 „	„



BULL-CALF 915.

Subcutaneous.

Dose : 100 mg.

Killed, December 7, 1905.

90 days.

P.M.—Local tumour partly fibro-calcareous, partly caseous. Prescapular gland contains caseo-calcareous nodules. Few minute glassy tubercles in lungs (S.T.)

VIRUS H. 52. "T.F."

T.F., Male, aged thirty-six, admitted to Hospital on June 3rd, 1905, suffering from Acute Pulmonary Phthisis. Died June 13th, 1905.

Family History.—The family history could not be obtained.

Clinical History.—The illness had commenced six months previously with cough and spitting of blood.

On admission the patient was in an extremely weak state, both lungs showing signs of very extensive disease. He got rapidly worse, and died ten days after admission.

POST-MORTEM EXAMINATION.

Thorax.

Lungs.—The right lung was collapsed, the upper portion being adherent to the costal pleura. There was a small circular opening leading into a small cavity, and also a second and much larger cavity, not communicating with the exterior of the lung. Many tubercles and numerous small cavities were found throughout the lung. The left lung was not opened at the post-mortem examination.

Bronchial Glands.—Enlarged.

Abdomen.

Peritoneum and Intestines.—Normal.

Mesenteric Glands.—Appeared to be slightly enlarged.

Liver.—Enlarged and fatty.

Spleen and Kidneys.—Normal.

Bones and Joints.—Normal.

DESCRIPTION OF MATERIAL RECEIVED AT BLYTHWOOD.

The left lung and mesenteric glands.

The Left Lung.—Was heavy and solid, and contained a great many caseous nodules, commencing to soften, and numerous irregular cavities of small size. The lung was pigmented and contained solid patches of greyish black colour, filled with caseating points. Almost the whole of the lung, excepting a small portion of the lower lobe, was entirely consolidated by this tissue.

Mesenteric Glands.—When dissected out did not appear to be abnormal in either size or structure.

An emulsion was made from softening caseous nodules in the lung, and on microscopical examination was found to contain numerous tubercle bacilli.

No tubercle bacilli could be detected in scrapings made from the mesenteric glands.

CALF 903. (Virus H. 52. "T.F.")

Subcutaneous Inoculation of culture derived from human lung through Guinea-Pig 1565.

Dose—150 milligrammes.

Date—September 8th, 1905.

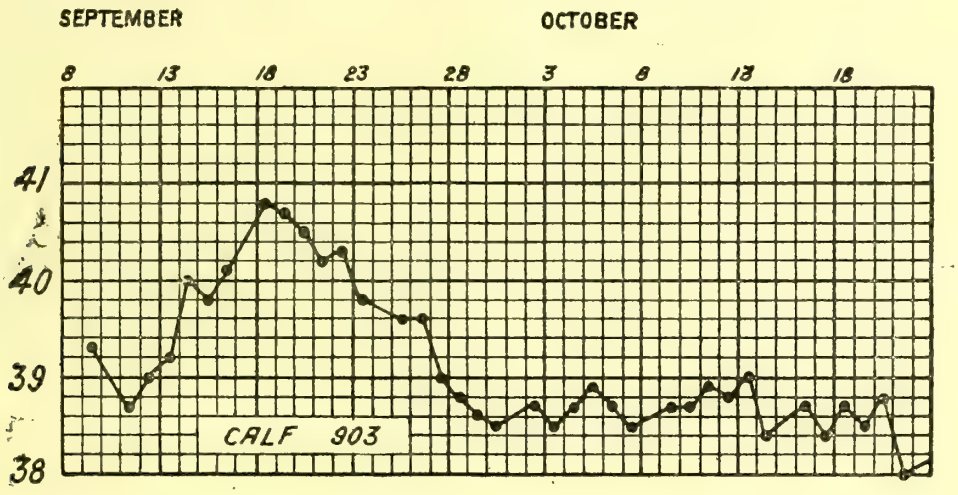
Weight at Inoculation—1 cwt. 0 qr. 21 lbs.

Killed—December 7th, 1905. [90 days after inoculation].

Clinical Notes.

The calf was inoculated on 8th September, 1905. It was quite ill about the fourth week after injection, and became very thin, remaining in this condition for some weeks. It slowly improved in appearance and general health, and had been fairly well for some time before it was killed; but though it gained weight during the latter period of the experiment, it was only 8 lbs. heavier at death than when injected three months before. It was killed on December 7th, 1905, 90 days after inoculation.

Temperature.



After October 18th the temperature varied between 38° and 39°.

Weights.

	cwts.	qrs.	lbs.	
September 8th, 1905 - -	1	0	21	Inoculated.
December 7th, 1905 - -	1	1	1	Killed.

Total gain of weight during experiment.—8 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Seat of Inoculation.—At the seat of inoculation, on the right side of the neck, was a small flat tumour.

On section the skin was seen to be very much thickened, and beneath it was a layer two inches in length and three quarters of an inch in breath of dense fibrous tissue in which calcareous foci were thinly scattered.

A small empty cavity in this tissue communicated with the exterior by a sinus (the tumour discharged on October 2nd). The subjacent muscle was not infiltrated.

Right Prescapular Gland.—Was somewhat enlarged, 2½ in. by ¾ in. About half its area was composed of caseous nodules, calcareous at their edges, and in parts softened.

Right Prepectoral Gland.—About the size of a pea, was caseo-calcareous throughout.

Lungs, Heart, Thoracic Glands, Pleura.—Normal.

Peritoneum, Omentum, Liver, Hepatic Glands, Spleen, Kidney, Suprarenals; Tongue, Pharynx, Palate, Tonsils; Pharyngeal, Submaxillary, Hyoid and Parotideal Lymphatic Glands; Intestines, Mesenteric Glands, Testes.—Normal.

Various Lymphatic Glands.

Left Prescapular, Axillary, Precrural, Popliteal, Gluteal, Ischiatic, Renal, Lumbar, Iliac, Pubic.—Normal.

CALF 915. (Virus H. 52. "T.F.")

Subcutaneous Inoculation of culture derived from human lung through Guinea-Pig 1565.

Dose—100 milligrammes.

Date—September 8th, 1905.

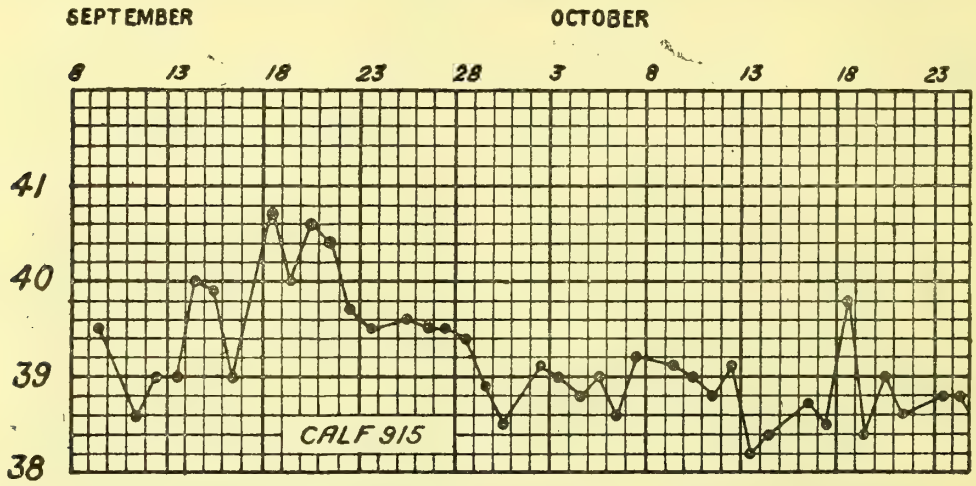
Weight at Inoculation—1 cwt. 0 qr. 0 lb.

Killed—December 7th, 1905. [90 days after inoculation].

Clinical Notes.

The calf was inoculated on September 8th, 1905. This calf, unlike its fellow, remained well during the period of the experiment, and grew rapidly. It was killed on December 7th, 90 days after inoculation.

Temperature.



After October 23rd the temperature remained normal till the animal was killed.

Weights.

The calf grew rapidly during the period of the experiment.

	cwts.	qrs.	lbs.	
September 8th, 1905 - -	1	0	0	Inoculated.
December 7th, 1905 - -	1	2	21	Killed.

Total gain of Weight during Experiment.—2 qrs. 21 lbs.

Average Rate of Gain per Week.—6 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Seat of Inoculation.—At the seat of inoculation, on the right side of the neck, was a tumour measuring 3½ in. by 3 in. It was fibro-calcareous, with an irregular central cavity containing tenacious cream-coloured pus. This central softened portion communicated with the exterior by a sinus, and the tumour had been discharging. The overlying skin was thickened, but not infiltrated.

Right Prescapular Gland.—Was slightly enlarged, 2½ in. by ¾ in. by 1 in. About half its area was occupied by caseo-calcareous nodules.

Thoracic Glands.—Normal.

Lungs.—A few (about six) very minute glassy tubercles, without opaque centres, were seen in the lungs.

Pleura, Heart.—Normal.

Omentum, Peritoneum, Liver, Spleen, Kidneys, Suprarenals.—Normal.

Tongue, Pharynx, Palate, Tonsils; Pharyngeal, Submaxillary, Hyoid, and Parotideal Lymphatic Glands; Intestines, Mesenteric Glands, Testes.—Normal.

Various Lymphatic Glands.

Left Prescapular, Axillary, Precrural, Popliteal, Gluteal, Ischiatic, Renal, Lumbar, Iliac.—Normal.

VIRUS H 53. "D.H."

LUPUS (Operation).

TABLE 53.

H 53 "D.H."

[LUPUS.]

CULTURE INOCULATIONS.

October 2, 1905.
Strain derived from human skin [lupus] through G.-P. 1482.
Total duration of artificial cultivation, 8½ months.
Culture used for injection, 8th, 21 days old, on pure bovine serum.



BULL-CALF 905.
Subcutaneous.
Dose : 50 mg.
Killed : January 1, 1906.
91 days.

Lungs extensively mottled with angular translucent patches, sometimes confluent, containing minute opaque foci. Other organs normal. Most of the lymphatic glands contained caseous or calcareous foci. (G.T. slight.)

RABBITS.

627	10 mg.	D. 18 days	Early Tuberculosis, complicated by cysticercosis.
628	1· „	D. 29 „	G.T.
629	1· „	D. 35 „	G.T.
630	0·1 „	D. 55 „	G.T.

GUINEA-PIGS.

1730	1· mg.	D. 13 days	G.T. acute.
1731	1· „	D. 14 „	
1732	0·1 „	D. 34 „	G.T.
1733	0·1 „	D. 16 „	G.T.

RAT.

43	100 mg.	D. 258 days	General dissemination of tubercle bacilli.

March 18, 1906.
Strain derived from prescapular gland of Calf 905.
Total duration of cultivation, 2½ months.
Culture used for injection, 4th, 22 days old, on pure bovine serum



CALF 973.
Subcutaneous.
Dose : 10 mg.
Killed : June 14, 1906.
88 days.

Small abscess tumour. Adjoining glands caseo-calcareous. Moderate number of small tubercles in spleen. Thoracic and mesenteric glands slightly affected. (S.T.)



CALF 975.
Subcutaneous.
Dose : 10 mg.
Killed : June 14, 1906.
88 days.

General tuberculosis, slight.



CALF 979.
Subcutaneous.
Dose : 50 mg.
Killed : June 29, 1906.
103 days.

Small abscess tumour. Fibro-calcareous nodules in prescapular gland. (L.T.)



CALF 993.
Subcutaneous.
Dose : 50 mg.
Killed : June 14, 1906.
88 days.

General tuberculosis, slight.

RABBITS.

818	1 mg.	D. 46 days	G.T.
817	0·1 „	D. 63 „	G.T.
816	0·01 „	D. 131 „	G.T.

March 30, 1906.
Strain derived from human skin [lupus] through G.-P. 1482.
Total duration of artificial cultivation, 14½ months.
Culture used for injection, 12th, 21 days old, on pure bovine serum.



BULL-CALF 977.
Subcutaneous.
Dose : 50 mg.
Killed : June 28, 1906.
90 days.

Fibro-calcareous and partly softened local tumour. Prescapular gland fibro-calcareous. Small number of small tubercles in lungs and spleen. Calcareous tubercles in thoracic and portal glands (numerous), and in most of the peripheral glands (scanty). (S.T.)

RABBITS.

830	10 mg.	D. 14 days	Early G.T.
831	1· „	D. 46 „	T.
832	0·1 „	D. 74 „	G.T.



BULL-CALF 1001.
Subcutaneous.
Dose : 50 mg.
Killed : June 29, 1906.
91 days.

Small local lesion. Calcareous prescapular gland. Very few minute tubercles in lungs and spleen. In several of the lymphatic glands was an occasional calcareous focus. (S.T.)

VIRUS H 53. "D.H."

D.H., FEMALE, AGED 14, ADMITTED TO HOSPITAL ON NOVEMBER 14TH, 1904, SUFFERING FROM LUPUS OF THE FACE. OPERATION—January 17th, 1905.

Family History.—Mother died of phthisis. Patient had two sisters living, aged thirteen and ten. Both these children were stated to be not robust, and to suffer from enlarged tonsils and adenoid disease, but showed no definite symptoms of tuberculosis. There was one brother, aged seventeen, who was healthy.

Clinical History.—Four years before admission the patient had been under treatment for "eczema." The disease was definitely diagnosed as lupus two years later. There were no symptoms of any constitutional disease.

The operation consisted in scraping away portions of diseased tissue, which were sent to Blythwood, and made into an emulsion, which on microscopic examination was seen to contain a very few beaded tubercle bacilli.

SUBSEQUENT HISTORY OF THE PATIENT.

The patient was seen one year later. She was then in excellent general health. She was undergoing treatment by Finsen light, and the local condition had much improved.

CALF 905. (Virus H 53. "D.H.")

Subcutaneous Inoculation of culture derived from human skin (lupus) through G.P. 1482.

Dose—50 milligrammes.

Date—October 2nd, 1905.

Weight at Inoculation—1 cwt. 1 qr. 2 lbs.

Killed—January 1st, 1906. [91 days after inoculation.]

Clinical Notes.

The calf was inoculated on October 2nd, 1905.

The tumour which developed at the seat of inoculation opened and discharged its contents; the opening afterwards healed up, leaving a depressed scar. The prescapular gland became moderately enlarged.

The calf remained well during the whole period of the experiment. It was killed on January 1st, 1906, 91 days after inoculation.

Temperature.

During the first 25 days after inoculation the temperature was irregular, varying between 38·5 and 39·8, the lowest and highest recorded. From October 27th the temperature was regular and normal.

Weights.

The calf grew very little during the experiment.

	cwts.	qrs.	lbs.	
October 2nd, 1905 - -	1	1	2	Inoculated.
January 1st, 1906 - -	1	1	15	Killed.

Total gain of weight during Experiment.—13 lb.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Quite good.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a depressed scar, round which the skin was much thickened, and under it was a small patch of dense dark brownish fibrous tissue containing caseous and calcareous grains.

Right Prescapular Gland.—Was moderately enlarged, and measured 2 in. by 1⅓ in. by 1¼ in. It contained two dense caseo-necrotic salmon-pink nodules, calcareous at their surfaces, which occupied together about half the gland. The rest of the cortex was packed with calcareous grains.

Left Prescapular Gland.—Contained a few caseo-fibrous tubercles, partly softened, and some rather large.

Right Prepectoral Gland.—About as large as a blackbird's egg; caseo-necrotic.

Right Axillary Gland.—Resembled the left prescapular gland.

Left Axillary Gland.—Normal.

Thorax.

Pleura.—Normal.

Lungs.—Were rather larger than normal, and were everywhere mottled with irregular grey and slightly translucent patches, which were more or less confluent, so that in many places they formed a sort of coarse network. These fibrous patches were angular in outline, and often looked as if they were made up of a number of little squares or triangles. Section showed that these fibrous patches were scattered throughout the whole of the organ, but they appeared rather smaller in the substance than on the surface. Close inspection showed the translucent patches to be finely mottled with more opaque points. Here and there small whitish calcareous foci were seen.

Trachea.—Normal.

Thoracic Glands.—Were slightly enlarged, the long one measuring 5¼ in. by 1¼ in. by ¾ in. It was firmer than normal, and contained some small calcareous grains scattered throughout the cortex, most of them being just below the capsule. The other thoracic glands were similar.

Heart.—Normal.

Abdomen.

Peritoneum, Omentum.—Normal.

Intestines.—Throughout the small intestine were numerous tuberculous foci. In the Peyer's patches were little yellow caseous points; towards the terminal part were numerous elevations with a small central depression. In the continuous Peyer's patches in the terminal part of the ileum were many little deeply pitted ulcers unlike any that had been hitherto seen. They seemed to penetrate the whole thickness of the patch and to have perpendicular or even overhanging margins which were only slightly elevated.

Large intestine normal.

Mesenteric Glands.—All the mesenteric glands contained small irregular yellow and calcareous foci in the cortex. One fibro-calcareous tubercle, ⅛ in. in diameter, was seen.

Spleen.—Normal.

Liver.—Normal.

Hepatic Glands.—Were not enlarged. Two minute calcareous foci were seen in them.

Kidneys, Suprarenals, Renal Glands, Lumbar Glands.—Normal.

Cœliac Glands.—Were similar to the mesenteric.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pubic, Right Gluteal.—All contained a few caseo-fibrous tubercles some rather large and partly softened.

Left Gluteal, Ischiatic.—Normal.

Popliteal.—Contained a few caseo-fibrous tubercles, some rather large and partly softened.

Submaxillary.—Each contained a few tubercles.

Parotideal.—Left contained large fibro-caseous tubercles, partly softened, as big as a large shot. Right contained one or two smaller but otherwise similar tubercles.

Posterior Pharyngeal.—Contained a moderate number of rather large caseous tubercles.

Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx, Larynx.—Normal.

Microscopical Examination.

Ulcers from Small Intestine (four films examined).—No tubercle bacilli seen.

CALF 973. (Virus H 53. "D.H.")

Subcutaneous Inoculation of culture derived from Calf 905.

Dose—10 milligrammes.

Date—March 18th, 1906.

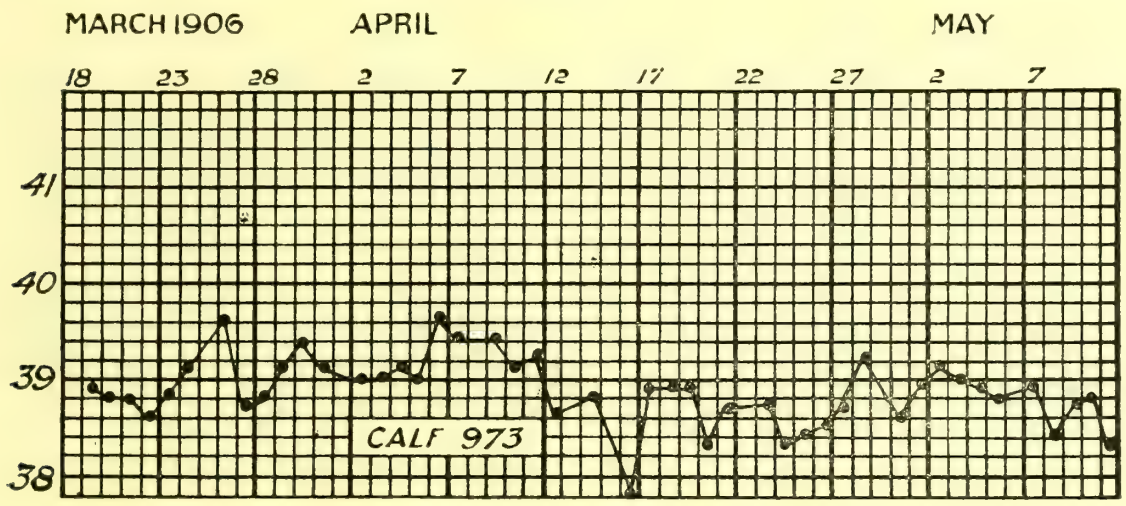
Weight at Inoculation—2 cwts. 0 qr. 14 lbs.

Killed—June 14th, 1906. [88 days after inoculation.]

Clinical Notes.

The calf was inoculated on March 18th, 1906. A fluctuating tumour developed at the seat of inoculation, and the prescapular gland became considerably enlarged. The calf remained well, and grew very fat. It was killed on June 14th, 1906, 88 days after inoculation.

Temperature.



From May 11th to June 14th, when the calf was killed, the temperature remained approximately normal.

Weights.

The calf increased in weight with exceptional rapidity.

	cwts.	qrs.	lbs.	
March 18th, 1906 - -	2	0	14	Inoculated
June 14th, 1906 - - -	2	3	27	Killed.

Total Gain of Weight during Experiment.—3 qrs. 13 lbs.

Average Rate of Gain per Week.—7·7 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

At the Seat of Inoculation.—On the right side of the neck, was a small fluctuating tumour measuring 3½ in. by 2½ in. by 2 in., and weighing 4 ozs. It consisted of a thick fibrous capsule containing fluid and caseous *débris*.

The Right Prescapular Gland.—Was enlarged, and measured 3 in. by 1½ in. by 1¼ in., and weighed 2 oz. It contained a large caseo-calcareous nodule 1¾ in. in longest diameter, as well as several smaller ones.

Two Prepectoral Glands.—About ½ in. in diameter, were caseo-necrotic with a calcareous margin, and encased in a dense fibrous capsule.

The Left Prescapular Gland and Axillary Glands.—Normal.

Pleura.—Normal.

Lungs.—Normal.

The Thoracic Glands.—Almost normal in size, contained a few scattered calcareous nodules.

Heart.—Normal.

Omentum and Peritoneum.—Normal.

Intestines.—Normal.

Mesenteric Glands.—In some of the mesenteric glands a few calcareous grains were seen.

Spleen.—The spleen contained small scattered tubercles; over a hundred were seen in a long flat section. They were small, with translucent margins and minute opaque centres.

Liver.—Normal.

Portal Glands.—Normal.

Kidneys.—Normal.

Suprarenals.—Normal.

Renal, Lumbar and Iliac Glands.—Normal.

Testes.—Normal.

Various Lymphatic Glands.

Precrural and Popliteal.—Normal.

Gluteal and Ischiatic.—Normal.

Pubic.—Normal.

Posterior-Pharyngeal, Submaxillary, Hyoid, and Subparotid.—Normal.

Tongue, Pharynx, Palate, Tonsils.—Normal.

Larnyx and Trachea.—Normal.

CALF 975. (Virus H 53. "D.H.")

Subcutaneous Inoculation of culture derived from Calf 905.

Dose—10 milligrammes.

Date—March 18th, 1906.

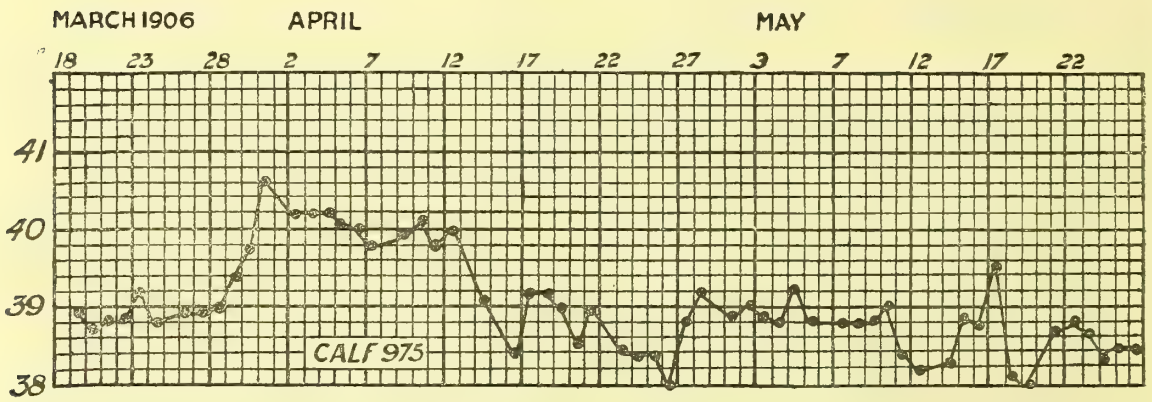
Weight at Inoculation—2 cwts. 0 qr. 18 lbs.

Killed—June 14th, 1906. [88 days after inoculation.]

Clinical Notes.

The calf was inoculated on March 18th, 1906. A fluctuating tumour developed at the seat of inoculation, and the nearest lymphatic glands became considerably enlarged. The calf suffered from slight constitutional disturbance immediately following the inoculation, accompanied by a rise of temperature (to 40·6° C), but soon recovered, and was fat and well when killed on June 14th, 1906, 88 days after inoculation.

Temperature.



From May 26th to June 14th, when the calf was killed, the temperature remained normal.

Weights.

	cwts.	qrs.	lbs.	
March 18th, 1906 - - -	2	0	18	Inoculated.
June 14th, 1906 - - -	2	2	13	Killed.

Total Gain of Weight during Experiment.—1 qr. 23 lbs.

Average Rate of Gain per Week.—4 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

At the Seat of Inoculation.—On the right side of the neck, was a fluctuating swelling measuring 4 in. by 2¾ in. by 2 in. and weighing 8 ozs.

It was composed of a dense capsule enclosing a fibro-necrotic mass slightly calcareous near its margins, partly separated from the under surface of the capsule and entirely separated on the superficial surface by a cavity containing a considerable quantity of fluid and caseous *débris*.

The Right Prescapular Gland.—Was enlarged, and measured 3⅛ in. by 2 in. by 1¼ in. It contained a fibro-necrotic nodule about 1 in. in diameter and many smaller calcareous nodules.

The Right Prepectoral Gland.—About ¾ in. in diameter, was fibro-necrotic throughout, partly calcareous at its margins, and enclosed in a very thick fibrous envelope.

The Left Prescapular and Axillary Glands.—Contained one or more small caseous tubercles each.

Pleura.—Normal.

The Lungs.—Everywhere contained air, but showed on their surfaces numerous little tubercles widely scattered. These were quite small, the larger about 1 mm. in diameter, grey and translucent, with opaque centres. On section of the lung these tubercles were seen to be fairly numerous. They resembled the little tubercles frequently seen in the lungs of animals injected with viruses of Group II., but they were considerably more numerous than in any but a few exceptional instances.

Trachea.—Normal.

The Peribronchial Glands.—Were as large as peas, and contained calcareous nodules.

The Thoracic Glands.—Were moderately enlarged, and their cortex chiefly consisted of calcareous nodules.

The Heart.—Was normal. It showed some soft villous tufts about the reflection of the pericardium.

The Peritoneum.—Was normal.

Intestines.—The small intestine showed a few tuberculous foci in the Peyer's patches.

The Mesenteric Glands.—Were for the most part normal. Here and there a small calcareous focus could be found.

The Spleen.—Contained a good many fibro-caseous tubercles, the larger about the size of small shot. About seventy were counted in a long flat section.

Liver.—On the surface of the liver a rather large number of very minute pale specks could be seen just through the capsule, a few only reaching a millimetre in diameter. They could be picked out on the point of a knife, and they cracked when crushed on a coverslip. On section they were seen to be numerous.

The Portal Glands.—Were enlarged, and their cortices were packed with fibrous and very calcareous nodules.

Kidneys.—One or two small tubercles were seen on the surface of each kidney, very similar to those on the liver.

Suprarenals.—Both suprarenals contained several caseous tubercles in the cortex, about the size of shot.

The Lumbar and Renal Glands.—Contained numerous calcareous grains.

The Iliac Glands.—Contained a few small caseous tubercles.

Pancreas.—Normal.

Testes.—Normal.

Various Lymphatic Glands.

Precrural and Popliteal, Gluteal and Pubic.—All contained one or more small caseous tubercles.

Ischiatic.—Normal.

Posterior-Pharyngeal and Hyoid, Submaxillary and Subparotid.—All contained a few tubercles.

Tongue, Pharynx, Palate, Tonsils, Larynx.—Normal.

Eyes.—Normal.

Microscopical Examination.

Minute Tubercle from Liver.—No tubercle bacilli seen.

CALF 979. (Virus H 53. "D.H.")

Subcutaneous Inoculation of culture derived from Calf 905.

Dose—50 milligrammes.

Date—March 18th, 1906.

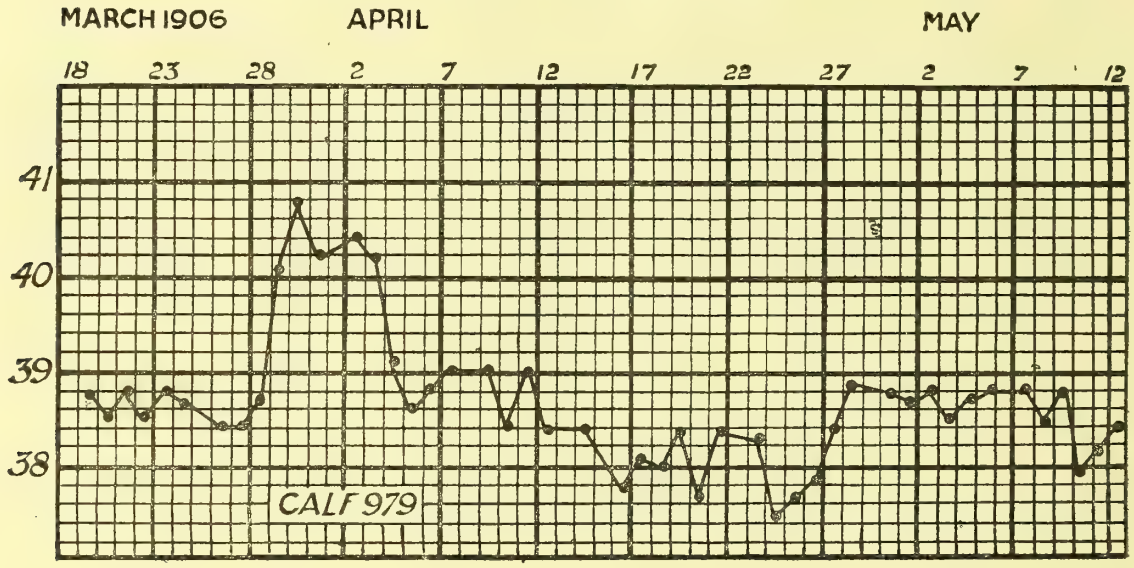
Weight at Inoculation—1 cwt. 2 qrs. 17 lbs.

Killed—June 29th, 1906. [103 days after inoculation.]

Clinical Notes.

The calf was inoculated on March 18th, 1906. It remained well, and grew very fat. It was killed on June 29th, 1906, 103 days after inoculation.

Temperature.



From May 12th to June 29th, when the calf was killed, the temperature remained normal.

Weights.

The calf gained weight rapidly during the experiment.

	cwts.	qrs.	lbs.	
March 18th, 1906 - - -	1	2	17	Inoculated.
March 29th, 1906 - -	2	1	22	Killed.

Total Gain of Weight during Experiment.—3 qrs. 5 lbs.

Average Rate of Gain per Week.—6 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

At the Seat of Inoculation, on the right side of the neck, was a small fluctuating swelling 3½ in. in length, consisting of a thick fibrous capsule, infiltrated towards the cavity with calcareous grains, and filled with caseo-pus.

The Right Prescapular Gland was slightly enlarged, and contained several fibrous nodules with calcareous grains.

The Prepectoral, Axillary, and Left Prescapular Glands.—Were normal.

Pleura.—Normal.

Lungs.—Normal.

Thoracic Glands.—Normal.

Heart.—Normal.

Peritoneum.—Normal.

Intestines.—Normal.

Mesenteric Glands.—Normal.

Liver.—Normal.

Portal Glands.—Normal.

Spleen.—Normal.

Kidneys.—Normal.

Suprarenals.—Normal.

Renal, Lumbar, and Iliac Lymphatic Glands.—Normal.

Testes.—Normal.

Various Lymphatic Glands.

Precrural and Popliteal, Gluteal and Ischiatic, Pubic, Posterior-Pharyngeal and Hyoid, Submaxillary and Subparotid.—Normal.

Tongue, Pharynx, Palate, Tonsils.—Normal.

CALF 993. (Virus H 53. "D.H.")

Subcutaneous Inoculation of culture derived from Calf 905.

Dose—50 milligrammes.

Date—March 18th, 1906.

Weight at Inoculation—1 cwt. 3 qrs. 19 lbs.

Killed—June 14th, 1906. [88 days after inoculation.]

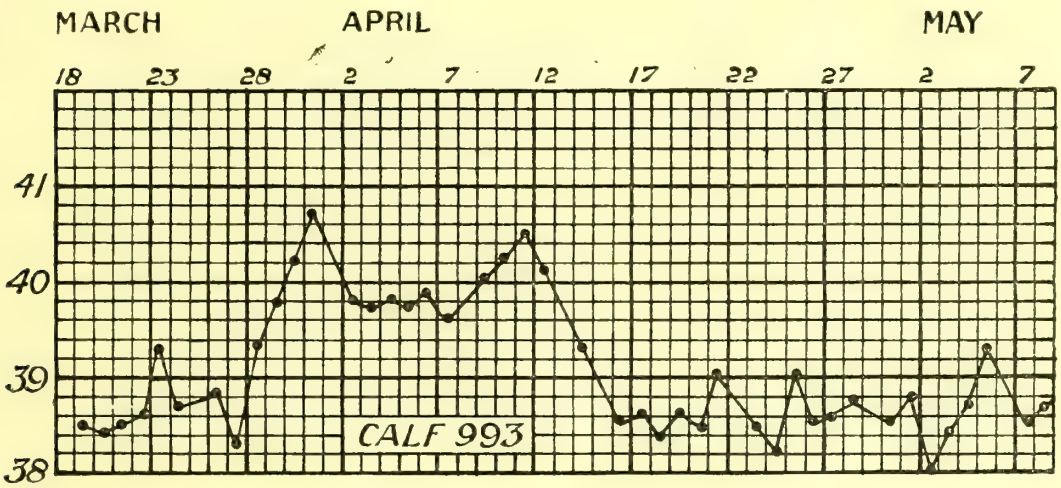
Clinical Notes.

The calf was inoculated on March 18th, 1906.

A large fluctuating tumour developed at the seat of inoculation, and the right prescapular gland became considerably enlarged.

The calf suffered from slight constitutional disturbance immediately following the inoculation, accompanied by a rise of temperature (to 40·7° C.), but soon recovered, and was fat and well when killed on 14th June, 88 days after inoculation.

Temperature.



From May 8th to June 14th, when the calf was killed, the temperature remained approximately normal.

Weights.

	cwts.	qrs.	lbs.	
March 18th, 1906 - - -	1	3	19	Inoculated.
June 14th, 1906 - - -	2	1	7	Killed.

Total Gain of Weight during Experiment.—1 qr. 16 lbs.

Average Rate of Gain per Week.—3·5 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

At the Seat of Inoculation.—On the right side of the neck was a large fluctuating tumour which measured 5½ in. by 5¾ in. by 3 in., and weighed 6 ozs. It was composed of a thick fibrous wall with trabeculæ, and it contained a large central caseo-fibrous slough which was almost everywhere separated from the surrounding tissue, and a large amount of caseo-purulent material.

The Right Prescapular Gland.—Was enlarged, measured 3¼ in. by 2 in. by 1½ in., and weighed 4 ozs. It was surrounded by a dense capsule, composed of salmon-pink fibro-necrotic tissue, which looked rather shrunken, and of which the marginal part was infiltrated by small calcareous grains.

The Right Prepectoral Gland.—Was enlarged, but contained only a few small tubercles.

The Left Prescapular and Axillary Glands.—Were packed with large fibro-caseous tubercles.

The Pleura.—Was normal.

The Lungs,—Were everywhere air containing, and presented an almost normal appearance, but on their surfaces a moderate number of small tubercles could be seen. A few of the largest of these were about ⅛ in. in diameter. They had dark grey semi-translucent margins and opaque firm whitish centres. The smaller tubercles were found on section scattered throughout the lung. They were fairly numerous, being present in every lobule, but they were not easily seen.

The Peribronchial Glands.—Were slightly enlarged, and were very calcareous.

The Thoracic Glands were enlarged and infiltrated with a moss-like caseous network which contained numerous calcareous grains.

Heart.—There was a small grey tubercle in the muscular tissue just beneath the intima of the right auricle. There was also what was probably a fibrous tubercle in the muscular wall of the left ventricle (no tubercle bacilli seen).

Intestines.—There were some small tubercles seen in the Peyer's patches of the small intestine.

Mesenteric Glands.—Were enlarged and all contained fibrous nodules packed with calcareous grains.

The Spleen.—Was enlarged, and rather thickly packed with yellow tubercles about the size of shot. On section they were seen to be solid and caseating, but not calcareous.

The Liver.—On the convex surface of the liver, towards the right, a few very minute pale specks could be seen through the capsule. One of these was picked out with a knife for microscopic examination (no tubercle bacilli seen). Similar specks were seen on section and appeared rather numerous.

The Portal Glands.—Were slightly enlarged, and contained numerous calcareous tubercles.

The Kidneys.—Were normal.

Suprarenals.—Each contained several grey fibrous tubercles with opaque centres.

The Renal and Lumbar Glands.—Contained many tubercles which were slightly calcareous.

Testes.—Normal.

Various Lymphatic Glands.

Precrural and Popliteal, Gluteal and Ischiatic, Pubic.—All were packed with large fibro-caseous tubercles often the size of small peas.

Submaxillary and Posterior-Pharyngeal, Hyoid and Subparotid.—All contained several shot-sized tubercles.

Tongue, Pharynx, and Tonsils.—Normal.

Larynx and Trachea.—Normal.

Microscopical Examination.

Minute Specks from Liver (two films examined).—No tubercle bacilli seen.

Tubercle ? from Left Ventricle of Heart.—No tubercle bacilli seen.

CALF 977. (Virus H 53. "D.H.")

Subcutaneous Inoculation of culture derived from human tissue (lupus), through Guinea-pig 1482.

Dose—50 milligrammes.

Date—March 30th, 1906.

Weight at Inoculation—1 cwt. 3 qrs. 17 lbs.

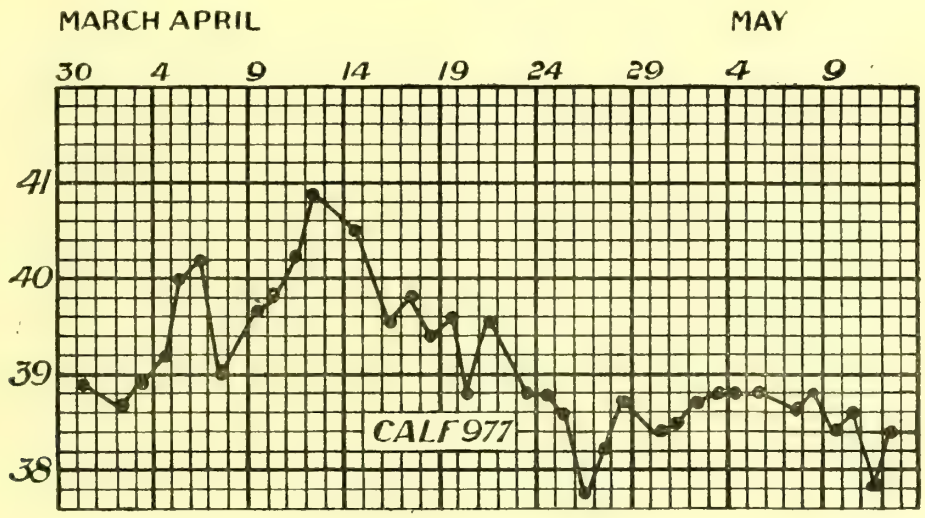
Killed—June 28th, 1906. [90 days after inoculation.]

Clinical Notes.

The calf was inoculated on March 30th, 1906. The development of the tumour at the seat of inoculation and of the neighbouring prescapular gland was similar to that frequently seen in calves injected with viruses of Group II.

The calf was unwell during the first month, and the temperature was high. After this its general health was good. It was killed on June 28th, 90 days after inoculation.

Temperature.



From May 12th to June 28th, when the calf was killed, the temperature remained normal.

Weights.

	cwts.	qrs.	lbs.	
March 30th, 1906 - - -	1	3	17	Inoculated
June 28th, 1906 - - -	2	0	4	Killed.

Total Gain of Weight during Experiment.—15 lbs.

Average Rate of Gain per Week.—1·1 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

At the Seat of Inoculation.—On the right side of the neck, was a prominent fluctuating swelling which measured 3½ in. by 2½ in. by 1¾ in. It did not infiltrate skin or subjacent muscle, and was composed of fibro-calcareous tissue, about one-third of which was broken down into caseo-purulent matter.

The Right Prescapular Gland.—Was enlarged, 3¼ in. in length. It was almost entirely composed of very calcareous fibrous tissue.

The Right Prepectoral Gland.—The size of a pea, was similar in structure, but not softened.

The Left Prescapular Gland.—Contained one or two calcareous foci.

The Axillary Glands.—Were normal.

Thorax.

Pleura.—Normal.

Lungs.—On the surface of the lungs a small number of little glassy tubercles were seen. Central opacities were very inconspicuous, and could only be made out in a few of the larger tubercles. Just dorsal to the root of the left lung, on the mediastinal surface, these little tubercles were comparatively numerous.

The Thoracic Glands.—Were not enlarged. In their cortices were rather numerous yellow calcareous, but not caseous, tubercles, about the size of mustard seeds. In the left bronchial these tended to become confluent.

Heart.—Normal.

Abdomen.

Intestines.—In two Peyer's patches were seen several little yellow points, and these readily shelled out. They were slightly calcareous when crushed. The intestines were otherwise normal.

Mesenteric Glands.—Almost all contained an occasional calcareous tubercle ; some of these were several millimetres in diameter.

Peritoneum.—Normal.

Spleen.—In the spleen an occasional small tubercle the size of a mustard seed was seen. On careful inspection twenty were counted in a great section.

Liver.—Normal.

Portal Glands.—Were similar to the thoracic.

Kidneys.—Normal.

Suprarenals.—A single tubercle was found in the left. The right was normal.

The Iliac (two) and *Renal Glands* (two) each contained an occasional calcareous focus.

The Lumbar Glands.—Were normal.

Genito-Urinary System.

Testes.—Normal.

Various Lymphatic Glands.

The following glands contained an occasional calcareous focus :

Both Precrural.
Right Popliteal.
Pubic.

The following contained an occasional yellow caseous and calcareous tubercle which readily shelled out :

Posterior Pharyngeal and Hyoid.

Submaxillary and Subparotid.

The following were normal :

Both Gluteal and Ischiatic.

Tongue, Pharynx, Palate, Tonsils.—Normal.

Microscopic Examination.

Tubercle from Portal Gland.—Tubercle bacilli.

Tubercle from Right Iliac Gland.—Tubercle bacilli.

Tubercle from Intestine.—Tubercle bacilli.

Tubercle from Mesenteric Gland.—Tubercle bacilli

CALF 1001. (Virus H 53. "D.H.")

Subcutaneous Inoculation of culture derived from human tissues (lupus), through Guinea-pig 1482.

Dose—50 milligrammes.

Date—March 30th, 1906.

Weight at Inoculation—1 cwt. 1 qr. 17 lbs.

Killed—June 29th, 1906. [91 days after inoculation.]

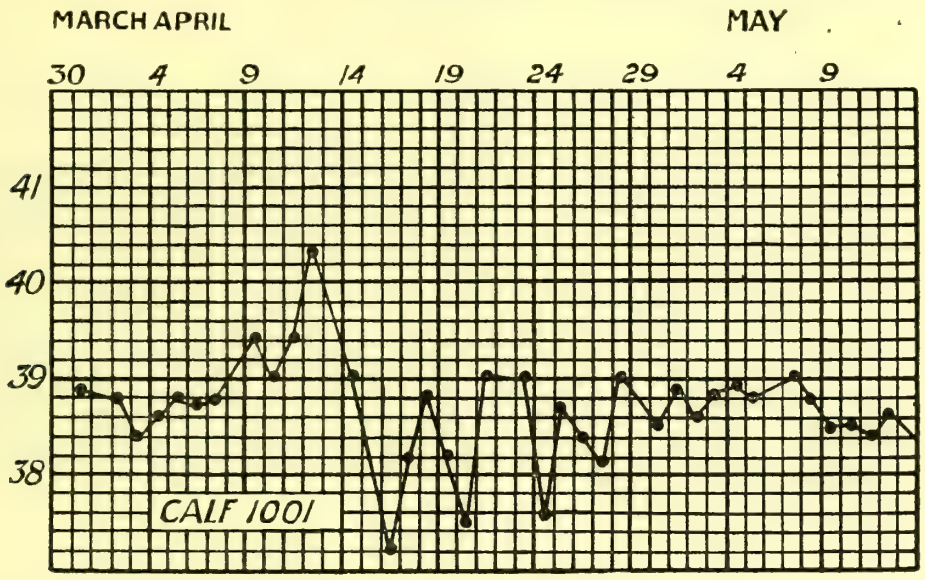
Clinical Notes.

The calf was inoculated on March 30th, 1906.

The development of the tumour at the seat of inoculation, and of the neighbouring prescapular gland, was similar to that frequently seen in calves injected with a virus of Group II.

The calf remained well, and was killed on June 29th, 1906, 91 days after inoculation.

Temperature.



From May 12th to June 29th, when the calf was killed, the temperature remained normal.

Weights.

	cwts.	qrs.	lbs.	
March 30th, 1906 - -	1	1	17	Inoculated.
June 29th, 1906 - -	1	2	11	Killed.

Total Gain of Weight during Experiment.—22 lbs.

Average Rate of Gain per Week.—1·7 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

At the Seat of Inoculation.—On the right side of the neck was a depressed sinus leading into some dense fibrous tissue surrounded by calcareous grains.

The Right Prescapular Gland.—Was slightly enlarged, and very hard. The cortex was packed with calcareous grains.

The Right Prepectoral Gland.—The size of a large pea, was caseo-necrotic, and calcareous at its margins.

Axillary and Left Prescapular Glands.—Normal.

Thorax.

Pleura.—Normal.

Lungs.—The right anterior lobe was carnified and pale in colour. In the rest of the right lung five very minute glassy tubercles with opaque calcareous centres were seen. There were none on the surface. None were discovered in the left lung, either on surface or in section. The villous fringes on the edges and surfaces of both lungs were slightly hypertrophied.

Thoracic Glands.—Were not enlarged. They contained a few widely scattered minute calcareous grains.

Heart.—On the dorsal surface of the left ventricle there were some rather firm pericardial adhesions. There was no sign of tuberculosis.

Abdomen.

Peritoneum.—Normal.

Intestines.—Normal.

Mesenteric Glands.—Normal.

Spleen.—About half a dozen little tubercles, the size of mustard seeds, and slightly calcareous, were found in the spleen.

Liver.—The villous tufts were visible on the surface of the liver. No tubercles were seen.

Portal Glands.—One contained a minute calcareous focus.

Kidneys.—Normal.

Suprarenals.—Normal.

The Renal and Lumbar Glands.—Each contained a single minute calcareous tubercle.

Testes.—Normal.

Tongue, Pharynx, Palate, Tonsils.—Normal.

Various Lymphatic Glands.

Right Popliteal.—Normal

Left.—Contained a single minute calcareous tubercle.

Precrural and Pubic.—Normal.

Gluteal and Ischiatic.—Normal.

Posterior Pharyngeal and Hyoid.—Normal.

Submaxillary and Subparotid.—Normal.

Microscopical Examination.

Tubercle from Spleen (two films examined.)—No tubercle bacilli were seen in the first, one in the second.

CALF 917. (Virus H 53. "D.H.")

Subcutaneous Inoculation of culture derived from human tissues (lupus), through G.P. 1482.

Dose—50 milligrammes.

Date—October 2nd, 1905.

Weight at Inoculation—1 cwt. 0 qr. 18 lbs.

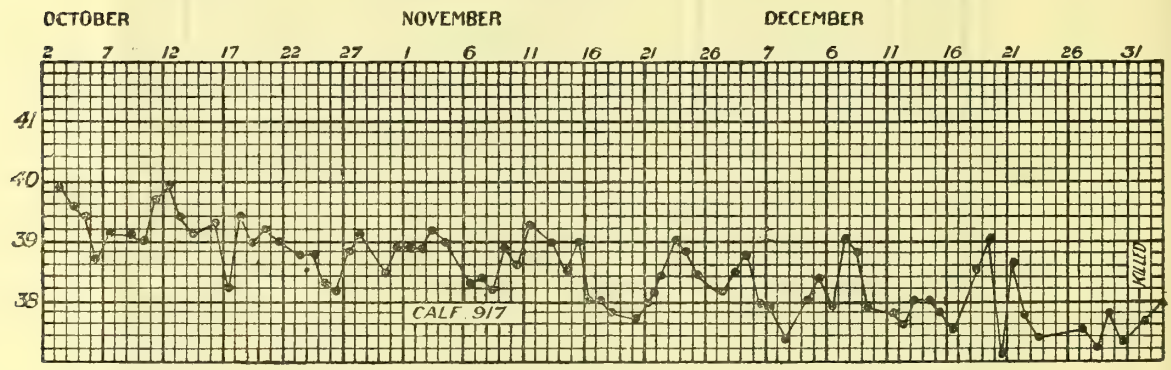
Killed—January 2nd, 1906. [92 days after inoculation.]

Clinical Notes.

The calf was inoculated on October 2nd, 1905.

A tumour of moderate size developed at the seat of inoculation, and during the whole period of the experiment the calf was thin and looked ill; the temperature was very irregular. It was killed on January 2nd, 1906, 92 days after inoculation.

Temperature.



Weights.

	cwts.	qrs.	lbs.
October 2nd - - - -	1	0	18
January 2nd - - - -	1	0	0

Total Loss of Weight during Experiment.—18 lbs.

Average Rate of Loss per Week.—1·4 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

Note.

As in all cases, this animal was tested with tuberculin at the quarantine sheds before being used for experiment. At the post-mortem examination tuberculous lesions were found in the glands nearest to the seat of injection of the tuberculin, and a small subcutaneous lesion was also found at the place where the tuberculin injection had been made, which had not been noticed before inoculation for experimental purposes. Obviously the animal had by some means become infected with tuberculosis at the time it was tested with tuberculin, and as no conclusions as to the virulence of the virus could be drawn from it, it was excluded from the experiment and does not appear in the Table. Another calf (No. 905) was inoculated with the same culture, the original one obtained from the virus.

It is difficult to explain how the accident occurred, but it may have been due to imperfect sterilisation of the instruments used for the tuberculin injection. The tuberculin used was prepared at Blythwood from cultures of three viruses (H. 37, "O. J."; H. 45, "F. M."; and H. 46. "H. W."), all of which were subsequently proved to be non-virulent for bovines. It was boiled and evaporated to a quarter of its original bulk, and then bottled and sterilised. It was tested on guinea-pigs and cannot produce infection.

POST-MORTEM EXAMINATION.

General Condition.—Somewhat thin.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was an oval fluctuating swelling, which measured $3\frac{3}{4}$ in. by 2 in. by $1\frac{1}{4}$ in., and weighed 4 ozs. It consisted of a fibrous wall with a ragged caseous lining, filled with turbid fluid.

Right Prescapular Gland.—Was enlarged, and measured 3 in. by $1\frac{3}{4}$ in. by $1\frac{1}{4}$ in., and weighed 2 ozs. It consisted partly of dense caseo-necrotic nodules, and elsewhere was packed with calcareous grains.

Left Prescapular Gland.—The left prescapular gland was somewhat enlarged, and contained a fibro-necrotic nodule 1 in. in diameter, as well as some smaller ones.

Right Prepectoral Gland.—As large as a pigeon's egg; was similar to the right prescapular gland.

Left Prepectoral Gland.—Was the size of a pigeon's egg, and similar in character to the left prescapular.

At the seat of injection of tuberculin on the left side of the neck was a small fibro-caseous mass $\frac{3}{4}$ in. in diameter, situated in the muscle just under the skin.

Right Axillary Gland.—Contained one tubercle.

Left Axillary Gland.—Normal.

Thorax.

Pleura.—There were some lobulated projecting tubercles along the margins of the lower ribs on the right side, and a few on the left. On the mediastinal pleura were a few similar tubercles, and on the pleural surface of the diaphragm was a large irregular nodular mass, as well as scattered tubercles.

Lungs.—Contracted well. They were spotted with a moderate number of little spherical tubercles about the size of small shot, surrounded by a narrow angular reddish zone. At the posterior angle of the left lung was an

irregular fibrous nodule, with a caseating network, involving several contiguous lobules, more or less loosely connected together, and measuring 1¼ in. by 1 in.

Thoracic Glands.—Were moderately enlarged. Their cortex consisted chiefly of dense fibrous tuberculous material, with yellow opaque dense patches.

Heart.—Normal.

Abdomen.

Peritoneum, Omentum.—There was a moderate number of tubercles on the omentum, and on the peritoneal surface of the diaphragm was a large nodular plaque, 4 in. by 2 in., and ½ in. in thickness. It went right through the diaphragm, and formed the mass of tubercles described on the pleural surface of the diaphragm. It was composed of dense fibrous tissue, with caseous foci. Besides this there were some scattered nodules.

Intestines.—Normal.

Mesenteric Glands.—Five contained fibro-caseous tubercles, as large as small peas.

Spleen.—The spleen contained four large tuberculous nodules similar to those in the liver, which caused projections on the surface, as well as several smaller ones.

Liver.—The right lobe of the liver was firmly adherent to the large nodular plaque described on the peritoneal surface of the diaphragm. Around the adhesion were a few small tubercles on the surface of the organ. In its substance were five dense fibrous tubercles of the size of large peas, each with caseous striæ.

Hepatic Glands.—Contained a few tubercles.

Kidneys.—The kidneys were mottled with little pale spots, which seemed to be formed of the same substance as the rest of the organs, and some of which were slightly pitted on the surface. In the left was a single small tubercle.

Suprarenals.—The left contained one small tubercle. The right was normal.

Renal Glands, Lumbar Glands.—Contained a few small fibro-caseous tubercles.

Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Posterior Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

Eyes.—Normal.

VIRUS H 54. "C.W.

SPLEEN. (Post-mortem).

VIRUS H 54. "C.W."

CULTURE INOCULATION.

October 4, 1905.

Strain derived from human spleen, through Guinea-pig 1609.

Total duration of artificial cultivation, 2 months.

Culture used for injection : 2nd, 23 days old, on pure bovine serum.



BULL-CALF 927.

Subcutaneous.

Dose : 50 mg.

Died : October 16, 1905.

12 days.

P.M. - Pneumonia. Minimal local lesion. Prescapular gland not definitely tuberculous. Few T.B. in some glands and organs.



BULL-CALF 935.

Subcutaneous.

Dose : 50 mg.

Killed : December 30, 1905.

87 days.

P.M.--Minimal lesion at seat of inoculation. Prescapular gland caseo-calcareous. **(L.T.)**

GUINEA-PIGS.

1738	1· mg.	Died, 15 days	G.T.
1739	1· mg.	„ 15 „	„
1740	0·1 mg.	„ 15 „	„
1741	0·1 mg.	„ 14 „	„

RAT. [P.]

45	85 mg.	Died, 13 days	Dissemination of T.B. Death from other causes.

RABBITS.

635	10 mg.	Killed 129 days	Slight tuberculosis of peritoneum, lungs and kidneys.
636	1· mg.	„ 129 „	Slight tuberculosis of peritoneum and lungs.
637	1· mg.	„ 129 „	Slight tuberculosis of peritoneum, lungs and kidneys.
638	0·1 mg.	Died 100 „	Chronic tuberculosis of peritoneum, lungs and kidneys ; rather severe for a virus of Group II.

VIRUS H 54. "C.W."

"C.W.," a Male Child, aged Three Years, admitted to Hospital on July 8th, 1905, suffering from Meningitis. Died on July 16th, 1905.

Family History.—Father's brother died of phthisis, but there was no other recorded case of tubercle in the family.

Clinical History.—The child had apparently been healthy from birth. No definite history of any previous illnesses could be obtained, or any reliable information as to the method of feeding.

No definite symptoms of illness appeared to have been noticed beyond the fact that he had been fretful and taken food badly for some little time before being brought to the hospital, and that he had vomited everything for the last two days.

On admission the child was drowsy and irritable. The pupils were equal, and reacted normally: there was no squint, and no twitching. The legs were rigid; the reflexes were increased. The abdomen was normal, and no symptoms could be detected in the chest. The pulse was irregular.

On opthalmoscopic examination the discs were well defined, and no tubercles could be seen.

Three days after admission the child was semi-comatose. The limbs were rigid, and both tonic and clonic convulsions of all four limbs were noted. There were coarse tremors on movement, and some twitchings were noticed. The conjunctivæ were injected, and there was left external squint. The child was constipated, and vomited once. The chest was dull on percussion over the right front and in the interscapular region, but there was no alteration in the breath sounds. Moist râles could be heard all over both the lungs, but were not very marked. There was no retraction of the abdomen. The liver could just be felt, but the spleen could not be detected. Subsequently the respirations became irregular in depth, but not in time.

During the remainder of the illness there was no alteration in the symptoms. The convulsions continued as before, and the child died one week after admittance.

POST-MORTEM EXAMINATION.

There were no scars in the neck.

Thorax.

Lungs.—Both lungs showed scattered tubercles throughout, more numerous in the right than in the left.

Bronchial Glands.—Were enlarged and one on the right side was caseating.

Abdomen.

Peritoneum.—Normal.

Intestines.—Were healthy, and not ulcerated.

Mesenteric Glands.—Were enlarged.

Liver and Spleen.—Both contained a few small tubercles.

Kidneys—Normal.

Meninges of Brain.—Were thickly studded with tubercles at the base and along the sylvian fissure. A few were also seen over the vertex.

Bones—Normal.

Joints—Normal.

DESCRIPTION OF MATERIAL RECEIVED AT BLYTHWOOD.

Bronchial Glands.—Both glands were slightly enlarged. One contained two nodules, each as large as a small pea, caseous and softened. The other consisted almost entirely of firm yellowish tissue in an early stage of caseation.

Two Cervical Glands were also received, and in one of them a small tuberculous focus, with a caseating centre, was found.

A Small Portion of Lung was received, and showed several very small grey tubercles.

The Spleen.—Showed similar grey tubercles.

Mesenteric Glands.—Were normal.

Microscopical Examination.

Bronchial Glands.—Tubercle bacilli numerous.

Tubercle from Spleen.—No tubercle bacilli were found.

Tubercle from Lung.—No tubercle bacilli found.

Note.—The appearance of the various tissues from this post-mortem received at Blythwood was such that there could be no reasonable doubt that the lesions in the bronchial glands were of older standing than those found elsewhere.

CALF 927. (Virus H 54. "C.W.")

Subcutaneous Inoculation of culture derived from human spleen, through Guinea-Pig 1609.

Dose—50 Milligrammes.

Date—October 4th, 1905.

Weight at Inoculation—1 cwt. 0 qr. 10 lbs.

Died—October 16th, 1905. [12 days after inoculation.]

Clinical Notes.

The calf was inoculated on October 4th, 1905. Nine days later the animal was noticed to be ill; its coat was staring, and it was lying down. The respiration was normal.

On October 16th, 12 days after inoculation, the animal died. (Death was due to pneumonia. *See* P.M.)

POST-MORTEM EXAMINATION.

General Condition.—Thin.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a very small swelling, about 2 ins. by 2 ins. by $\frac{5}{8}$ in. The central part had a caseous appearance, and there was a small irregular cavity containing serum.

Right Prescapular Gland.—Was somewhat swollen. Its cortex was a little firmer than usual, and more opaque. There was no definite sign of tubercle.

Left Prescapular Gland, Right Prepectoral Gland, Axillary Glands.—Normal.

Thorax.

Pleura.—Normal.

Lungs.—The anterior half of the lungs was consolidated, of a pinkish colour, and had a somewhat nodular surface. The line of demarcation, which was in the anterior part of the posterior lobe, was sharply defined, and the consolidated tissue in this neighbourhood was of a dark purple colour, and not nearly so firm as the more anterior portions.

Section of the older solid portion showed pea-sized nodules with pultaceous contents; apparently a piece of necrotic lung substance, surrounded by a whitish capsule lined by a little mucus.

Thoracic Glands, Heart.—Normal.

Abdomen.

Peritoneum, Intestines, Mesenteric Glands, Spleen, Liver, Hepatic Glands, Kidneys, Suprarenals, Rena, Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal.—Normal.

Submaxillary, Parotideal, Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

Microscopical Examination.

Scraping from Prepectoral Gland.—Tubercle bacilli few.

Scraping from Popliteal Gland.—No tubercle bacilli.

Scraping from Long Thoracic Gland.—No tubercle bacilli.

Pultaceous Contents from Lung Nodule.—No tubercle bacilli.

Scraping from Normal Lung.—No tubercle bacilli.

Scraping from Hepatic Gland.—Three tubercle bacilli seen.

Scraping from Liver.—No tubercle bacilli.

Scraping from Spleen.—Four tubercle bacilli seen.

Scraping from Kidney.—No tubercle bacilli.

Rib Marrow.—No tubercle bacilli.

CALF 935. (Virus H 54. "C.W.")

Subcutaneous Inoculation of culture derived from human spleen, through Guinea-Pig 1609.

Dose—50 milligrammes.

Date—October 4th, 1905.

Weight at Inoculation—1 cwt. 0 qr. 13 lbs.

Killed—December 30th, 1905. [87 days after inoculation.]

Clinical Notes.

The calf was inoculated on October 4th, 1905. The development of the tumour at the seat of inoculation and of the nearest lymphatic gland, was similar to that usually seen in calves inoculated with 50 milligrammes of a virus of Group II.

The calf was killed on December 30th, 87 days after inoculation. It had remained well during the entire period of the experiment.

Temperature.

Except for a slight and transient rise shortly after inoculation, the temperature was normal.

Weights.

The calf gained weight normally during the experiment.

	cwt.	qrs.	lbs.	
October 4th, 1905 - -	1	0	13	Inoculated.
December 30th, 1905 -	1	2	7	Killed.

Total gain of weight during experiment.—1 qr. 22 lbs.

Average rate of gain per week.—4 lbs.

Tuberculin Test.—The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a depressed scar, beneath which the skin was greatly thickened; deeper still was a patch of dense brownish fibrous tissue, which contained some little caseous and calcareous tubercles.

Right Prescapular Gland.—Was moderately enlarged and consisted almost entirely of two large tuberculous nodules, caseous and largely softened, and partly calcareous.

Left Prescapular Gland, Right Prepectoral Gland, Axillary Glands.—Normal.

Thorax.

Pleura, Lungs, Thoracic Glands, Heart.—Normal.

Abdomen.

Peritoneum, Omentum, Intestines, Mesenteric Glands.—Normal.

Spleen, Liver, Hepatic Glands, Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal, Submaxillary, Parotideal, Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx.—Normal.

VIRUS H 55. "R.D."

MESENTERIC GLANDS. (Post-mortem.)

VIRUS H. 55. "R.D."

CULTURE INOCULATION.

November 6, 1905.

Strain derived from human mesenteric glands, direct.

Total duration of artificial cultivation : 3 months.

Second sub-culture used for injection, 21 days old, on pure bovine serum.



BULL-CALF 937.

Subcut.

Dose : 50 mg.

Killed, Feb. 6, 1906.

92 days.

Fibrous walled tumour at seat of inoculation, with cascous contents ; caseo-calcareous nodules and calcareous grains in nearest glands. (L.T.)

GUINEA-PIGS.

1780	1· mg.	Died, 17 days	G.T.
1781	1· mg.	„ 16 „	„
1782	0·1 mg.	„ 29 „	„
1783	0·1 mg.	„ 20 „	„

RABBITS.

662	10· mg.	Killed, 93 days	Slight tuberculosis of peritoneum, lungs, and kidneys.
663	1· mg.	Died, 64 „	Tuberculous peritonitis, slight tuberculosis of lungs. Death from other causes.
664	1· mg.	Killed, 93 days	Slight tuberculosis of peritoneum, lungs and kidneys.
665	0·1 mg.	„ „	Slight tuberculosis of peritoneum, lungs, liver, spleen and kidneys.



BULL-CALF 943.

Subcut.

Dose : 50 mg.

Killed, Feb. 6, 1906.

92 days.

Fibrous-walled tumour, with softened cascous contents. Nearest glands contained caseo-calcareous nodules. (L.T.)

VIRUS H 55. "R.D."

R. D., a Male Child, aged Two and Three-quarter Years, Admitted to Hospital on July 26th, 1905, Suffering from Whooping Cough. Died August 1st, 1905.

Family History.—Unknown.

Clinical History.—No reliable facts could be obtained regarding the history of the child beyond the fact that it had suffered from whooping cough for three weeks before being brought to the hospital.

On admission the child was pale and obviously ill, and its face was much swollen. There was considerable dyspnœa, and fine crepitations could be heard over both lungs. The heart was somewhat dilated. The abdomen was distended, and both the liver and spleen were enlarged, and could be distinctly felt.

The child developed signs of broncho-pneumonia, and died five days after admission.

POST-MORTEM EXAMINATION.

Thorax.

Lungs.—Showed evidence of recent broncho-pneumonia, but none of tuberculous disease.

Bronchial Glands.—Were enlarged, and apparently caseating.

Abdomen.

Peritoneum.—Was normal in appearance.

Mesenteric Glands.—Were enlarged.

Intestines.—Showed a few ulcerated patches.

Spleen.—Showed a few scattered tubercles.

Liver and Kidneys.—Normal.

Bones and Joints.—Healthy.

There were no scars in the neck, but several enlarged cervical glands could be felt.

DESCRIPTION OF MATERIAL RECEIVED AT BLYTHWOOD.

(The specimens received were not examined at once, but after having been used for sowing cultures, were hardened in formalin. The following description deals with the material after hardening.)

A Large Cervical Gland, measuring $1\frac{3}{4}$ in. by $1\frac{1}{4}$ in. Showed on section a number of opaque whitish patches, but the rest of the gland tissue was apparently normal.

The Mesentery.—Contained large numbers of slightly enlarged glands. Most of them showed irregular whitish spots, similar to those found in the cervical gland.

The disease in the two sets of glands appeared to be in exactly the same stage.

The Bronchial Glands.—Were also enlarged, and were similar in appearance to the cervical and mesenteric.

Small Portions of Lung and Kidney received showed no tuberculous disease.

Spleen.—Showed a few small tubercles.

Microscopical Examination.

A few tubercle bacilli were seen in smears from the cervical, bronchial and mesenteric glands.

CALF 937. (Virus H 55. "R.D.")

Subcutaneous Inoculation of culture derived from human mesenteric glands.

Dose—50 milligrammes.

Date—November 6th, 1905.

Weight at Inoculation—3 qrs. 18 lbs.

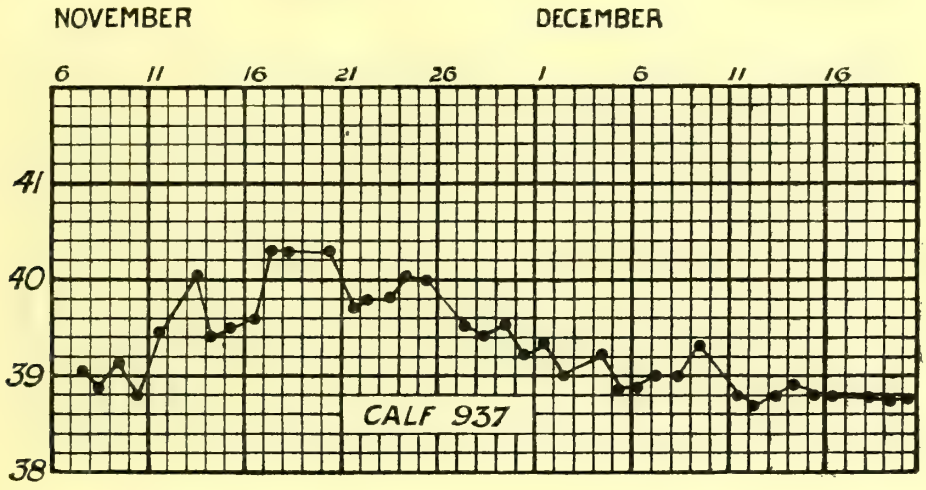
Killed—February 6th, 1906. [92 days after inoculation.]

Clinical Notes.

The calf was inoculated on November 6th, 1905. The development of the tumour at the seat of inoculation and of the nearest lymphatic gland was similar to that usually seen in calves injected with 50 mg. of a virus of Group II.

The calf was killed on February 6th, 1906, 92 days after inoculation. Except for a slight constitutional disturbance at the commencement, it remained well during the period of the experiment.

Temperature.



From December 20th to February 6th, when the calf was killed, the temperature remained approximately normal.

Weights.

The gain of weight per week during the experiment was but little below the average for healthy calves.

	cwts.	qrs.	lbs.	
November 6th, 1905 - -	0	3	18	Inoculated.
February 6th, 1906 - -	1	1	3	Killed.

Total gain of weight during experiment—1 qr. 13 lbs.

Average rate of gain per week—3·1 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

At the seat of inoculation, on the right side of the neck, was a prominent fluctuating tumour, which measured $3\frac{1}{4}$ in. by $2\frac{1}{2}$ in. by $1\frac{3}{4}$ in., and weighed 8 ozs. It consisted of a fibrous sac containing softened caseous *débris*.

The Right Prescapular Gland.—Was moderately enlarged, and contained a caseo-necrotic nodule, the rest of the gland being packed with calcareous grains.

The Left Prescapular Gland.—Was normal.

The Right Prepectoral Gland.—Was as large as a large pea. It had a thick fibrous capsule and was caseo-necrotic throughout.

The Axillary Glands.—Were normal.

Pleura, Lungs, Bronchial and Mediastinal Glands, Heart, Peritoneum and Omentum, Intestines, Mesenteric Glands, Spleen, Liver, Portal Glands, Kidneys, Suprarenals, Renal, Lumbar, and Iliac Glands, Tongue, Pharynx, Palate, Tonsils, Larynx, Testes, Eyes.—Normal.

Various Lymphatic Glands.

Precrural, Pubic, Gluteal, Ischiatic, and Popliteal.—Normal.

Submaxillary, Hyoid, Subparotid and Post-Pharyngeal.—Normal.

CALF 943. (Virus H 55. "R.D.")

Subcutaneous Inoculation of culture derived from human mesenteric glands.

Dose—50 milligrammes.

Date—November 6th, 1905.

Weight at Inoculation—3 qrs. 19 lbs.

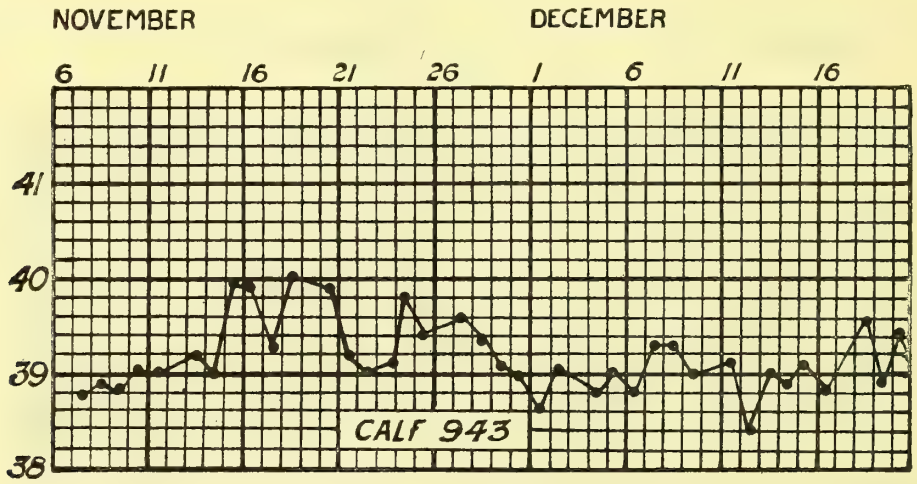
Killed—February 6th, 1906. [92 days after inoculation.]

Clinical Notes.

The calf was inoculated on November 6th, 1905. The development of the tumour at the seat of inoculation and of the nearest lymphatic gland was similar to that usually seen in calves inoculated with 50 mgs. of a virus of Group II.

The calf was killed on February 6th, 1906, 92 days after inoculation. It had remained well during the period of the experiment.

Temperature.



From December 20th to February 6th, when the calf was killed, the temperature remained approximately normal.

Weights.

The gain of weight per week during the experiment was equal to the average for healthy calves.

	cwts.	qrs.	lbs.	
November 6th, 1905 - -	0	3	19	Inoculated.
February 6th, 1906 - -	1	1	21	Killed.

Total gain of weight during experiment.—2 qrs. 2 lbs.

Average rate of gain per week.—4·4 lbs.

Tuberculin Test.

The calf was not tested subsequent to the inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

At the seat of inoculation, on the right side of the neck, was a rounded and prominent tumour weighing 6 ozs., and measuring 3 in. by 2 in. by $1\frac{3}{4}$ in., with a small narrow prolongation downwards and backwards towards the shoulder, about 1 in. in length.

On section the tumour was found to contain a large quantity of thick greenish yellow pus with caseo-calcareous *débris.* The walls of the cavity were fibrous, and to them were attached irregular masses of caseo-calcareous tissue in process of detachment. The above-mentioned prolongation was on section fibrous, with caseo-calcareous nodules.

The Right Prescapular Gland.—Was enlarged, $2\frac{1}{4}$ in. in length. On section it consisted mainly of large caseo-calcareous nodules, the intervening gland tissue being soft and brownish in colour.

The Left Prescapular Gland.—Was normal in size and appearance.

The Right Prepectoral Gland.—The size of a large pea, contained a caseo-calcareous nodule occupying half its volume.

The Axillary Glands.—Were normal.

Pleura, Lungs, Bronchial, and Mediastinal Glands, Heart, Peritoneum and Omentum, Intestines, Mesenteric Glands, Spleen, Liver, Portal Glands, Kidneys, Suprarenals, Renal, Lumbar, and Iliac Glands, Tongue, Pharynx, Palate, Tonsils, Larynx, Testes, Eyes.—Normal.

Various Lymphatic Glands.

Precrural, Pubic, Gluteal, Ischiatic and Popliteal.—Normal.

Submaxillary, Hyoid, Subparotid and Post-Pharyngeal.—Normal.

VIRUS H 56. "F.T"

LUNG. (Post-mortem.)

VIRUS H 56. "F.T."

CULTURE INOCULATIONS.

(I.) December 7th., 1905.

Strain derived from human lung, through G.P. 1682.

Total duration of artificial cultivation : 3 months.

Culture used for injection : 3rd, 21 days old, on pure bovine serum.



BULL-CALF 951.

Subcutaneous.

Dose : 100 mg.

Killed : March 8, 1906.

91 days.

Prominent fibrous tumour with small central cavity containing softened caseous matter. Nearest glands contained caseo-calcareous nodules. [**L.T.**]



BULL-CALF 955.

Subcutaneous.

Dose : 100 mg.

Killed : March 8, 1906.

91 days.

Small dense nodular puckered swelling packed with calcareous grains. Several pea-sized calcareous foci in prescapular gland. [**L.T.**]

RABBITS.

707	10 mg.	Killed 104 days	Slight tuberculosis of peritoneum, lungs, kidneys and liver.
708	1· „	„ „ „	Slight tuberculous peritonitis, trace in kidneys
709	1· „	„ „ „	Slight tuberculosis of peritoneum, kidneys, lungs and liver.
710	0·1 „	„ „ „	Slight tuberculous peritonitis, trace in lungs and right kidney

GUINEA-PIGS.

1789	1 mg.	Died 21 days.	G.T.
1790	1· „	„ 16 „	„
1791	0·1 „	„ 21 „	„
1792	0·1 „	„ 22 „	„

FOWL 4.

Fed, 35 mg.

Killed 103 days. No tuberculosis.

FOWL 3.

Intrap. 10 mg.

Killed 102 days. Small tuberculous lesion in liver and some little translucent tubercles in lungs.

E. of tubercle from Liver.

G.P. 887. Killed 65 days. Slowly progressing tuberculosis, similar to that produced by a small dose of mammalian T.B.

VIRUS H 56. "F.T."

CULTURE INOCULATIONS—*continued*

(II.) March 20, 1906.

Strain derived from human lung, through Guinea-pig 1682.
Total duration of artificial cultivation : 6½ months.
Culture used for injection : 7th, 21 days old, on pure bovine serum.

PIG 21.
Subcutaneous.
Dose : 1 mg.
Killed : June 26, 1906.
98 days.
Small local lesion. Nearest lymphatic gland contained a caseous nodule. Some small caseous tubercles in lungs; very few in liver, spleen, and mesenteric glands. (**S.T.**)

PIG 23.
Subcutaneous.
Dose : 50 mg.
Killed, May 24, 1906.
65 days.
Small local lesion. Nearest glands caseous. Rather numerous minute translucent foci in lungs. (**S.T.**)

PIG 25.
Fed.
Dose : 50 mg.
Killed : June 26, 1906.
98 days.
Numerous caseous foci in submaxillary and mesenteric glands. Three minute tubercles in lungs. Several caseous foci in one bronchial gland. (**S.T.**)

PIG 27.
Fed.
Dose : 1 mg.
Killed : June 27, 1906.
99 days.
Submaxillary glands caseous. Two mesenteric glands contained small caseous nodules. Three minute (?) tubercles in lungs. (**S.T.**)

BABOON 1.
Fed.
Dose : 1 mg.
Killed when dying : July 5, 1906.
108 days.
General tuberculosis.

BABOON 3.
Subcutaneous.
Dose : 1 mg.
Died : April 27, 1906.
38 days.
Early general tuberculosis. Cause of death undetermined.

RABBIT.

819	1 mg.	K. 99 days	Slight tuberculosis of peritoneum and lungs, (?) trace in kidneys.

FOWL 5.
Intraperitoneal.
Dose : 15 mg.
Killed, 69 days.
T.B. were found in nodules on mesentery, and in little necrotic patches on liver, but there was no true tuberculosis.

(III.) May 28, 1906.

Strain derived from same source.
Total duration of cultivation : 8½ months.
Culture used for injection : 10th, 20 days old, on pure bovine serum.

PIG 37.
Fed.
Dose : 50 mg.
Killed : August 27, 1906.
91 days.
Submaxillary and mesenteric glands contained shot-sized caseous tubercles. Intestines normal. Four small tubercles in lungs. (S.T.)

PIG 43.
Subcutaneous.
Dose : 50 mg.
Killed : August 27, 1906.
91 days.
Small local lesion. Nearest glands caseo-necrotic and partly calcified. Moderate number of translucent tubercles in lungs, some with minute opaque centres. Several lymphatic glands contained small tuberculous foci.

VIRUS H 56. "F.T."

F.T., Male, aged Thirty-five, admitted to Hospital on August 15th, 1905, suffering from Phthisis. Died on August 18th, 1905.

Family History.—No history of tuberculosis in the family.

Clinical History.—The patient had suffered from pneumonia in 1897, but before this he had apparently been in good health. He was invalided out of the Navy on account of consumption. He had had several attacks of hæmoptysis on three or four occasions, the last being two years before admission. Five weeks before admission he had been discharged from a German sanatorium as "cured." The day before admission he had suffered from a very severe attack of hæmoptysis.

On admission he was found to be very cyanosed. The only physical signs detected were abundant râles and rhonchi all over the chest. The sputum was found to be swarming with tubercle bacilli.

Two days afterwards the cyanosis had increased, and he was bled 13 ozs. This gave temporary relief, but he died the next morning. The temperature had varied between 101° and 102·6°, but during the last twelve hours of life it gradually sank to normal.

POST-MORTEM EXAMINATION.

There were no scars in the neck or elsewhere.

Thorax.

Lungs.—The right lung was studded with small tubercles, and contained one or two very small cavities. The left lung was not examined at the post-mortem.

Bronchial Glands.—Appeared to be slightly enlarged.

Abdomen.

Peritoneum and all Abdominal Organs.—Normal, with the exception of the *Spleen* and *Kidneys*, which were slightly congested.

Brain.—Was not examined.

Bones.—Healthy.

Joints.—Healthy.

DESCRIPTION OF MATERIAL RECEIVED AT BLYTHWOOD.

A Left Lung.—The whole organ was deeply congested, and very full of exudation. Over the posterior part of the apex the greatly thickened pleura was adherent. Immediately beneath was an oval-shaped cavity with thick walls, lined by whitish caseous débris, and containing a thick pink-coloured fluid. In other parts of the lung were small solid nodules, varying in size, uniformly and widely distributed.

Microscopical Examination.

Scraping from the Solid Nodules.—Showed a few tubercle bacilli.

CALF 951. (Virus H 56. "F.T.")

Subcutaneous Inoculation of culture derived from human lung, through Guinea-Pig 1682.

Dose—100 milligrammes.

Date—December 7th, 1905.

Weight at Inoculation—1 cwt. 0 qr. 13 lbs.

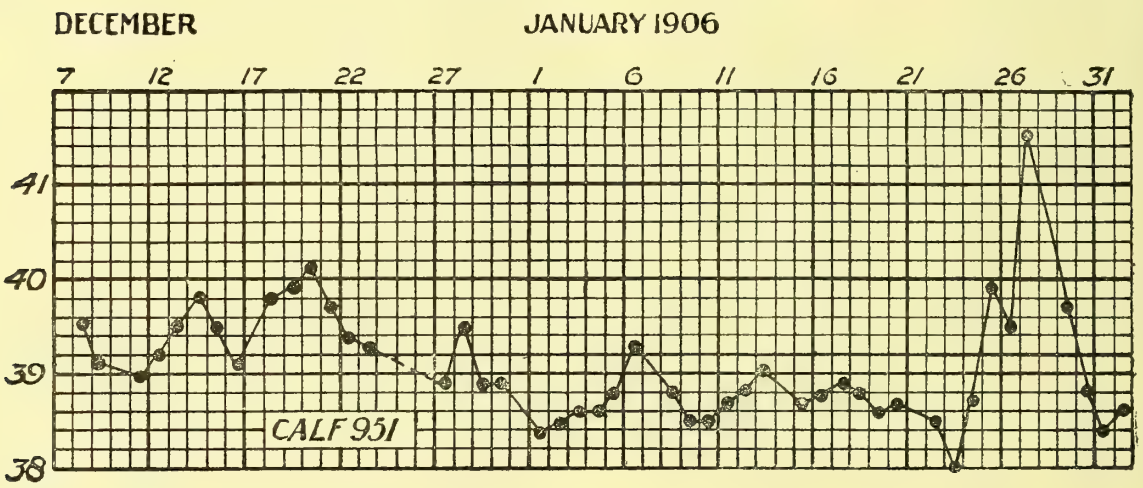
Killed—March 8th, 1906. [91 days after inoculation.]

Clinical Notes.

The calf was inoculated on December 7th, 1905. The development of the tumour at the seat of inoculation, and of the nearest lymphatic gland, was similar to that usually seen in calves inoculated with 50 mgs. of a virus of Group II.

The calf was killed on March 8th, 1906, 91 days after inoculation. It suffered from the usual constitutional disturbance shortly after inoculation, but soon recovered and was quite well when killed.

Temperature.



The sudden rise of temperature during the last week in January cannot be accounted for. From February 1st to March 8th, when the calf was killed, the temperature remained normal.

Weights.

The calf grew but little during the experiment.

	cwts.	qrs.	lbs.	
December 7th, 1905 - - -	1	0	13	Inoculated.
March 8th, 1906 - - -	1	1	6	Killed.

Total gain of weight during experiment.—21 lbs.

Average rate of gain per week.—1·6 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

At the Seat of Inoculation.—On the right side of the neck, was a prominent tumour measuring 3 in. by $2\frac{1}{4}$ in. by $1\frac{1}{4}$ in., and weighing 4 ozs. There was a small opening closed by a scab. On section it was seen to be composed of thickened skin and dense fibrous tissue enclosing a small cavity full of softened pultaceous caseous matter.

The Right Prescapular Gland.—Was slightly enlarged, and contained a softened caseous nodule with calcareous margin measuring 1 in. in long diameter, and several smaller ones.

The Right Prepectoral.—Was as large as a pea, and contained a similar nodule

Two Deep Cervical Glands.—Each as big as a pea, contained a fibro-calcareous nodule.

Left Prescapular and Axillary Glands.—Normal.

Pleura, Lungs, Thoracic Glands, Heart and Pericardium.—Normal.

Omentum and Peritoneum, Intestines, Mesenteric Glands, Spleen, Liver, Hepatic Glands.—Normal.

Kidneys.—Two little pale points were seen on the surface of the right. On section these were not sharply defined, and seemed to fade gradually into normal tissue substance. Left kidney normal.

Suprarenals; Renal, Lumbar, and Iliac Glands; Testes.—Normal.

Various Lymphatic Glands.

Precrural, Pubic, Gluteal and Ischiatic, Popliteal.—Normal.

Submaxillary, Subparotid, Post-pharyngeal, Hyoid.—Normal.

Tongue, Pharynx, Palate, Tonsils.—Normal.

Eyes.—Normal.

Microscopic Examination.—Pale point from right kidney; no tubercle bacilli.

CALF 955. (Virus H 56. "F.T.")

Subcutaneous Inoculation of culture derived from human lung through Guinea-Pig 1682.

Dose—100 milligrammes.

Date—December 7th, 1905.

Weight at Inoculation—1 cwt. 0 qr. 3 lbs.

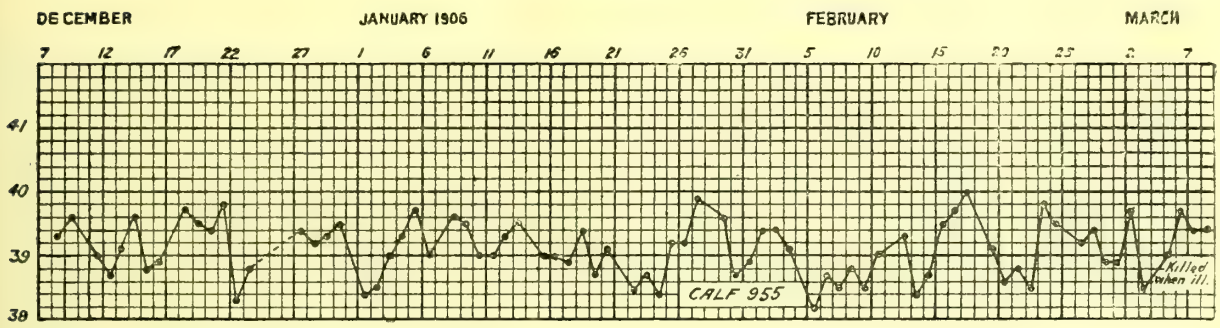
Killed—March 8th, 1906. [91 days after inoculation.]

Clinical Notes.

The calf was inoculated on December 7th, 1905. The development of the tumour at the seat of inoculation, and of the nearest lymphatic gland, was similar to that usually seen in calves inoculated with 50 mgs. of a virus of Group II.

The animal was killed on March 8th, 1906, 91 days after inoculation, when ill, and in poor condition. It had been unwell for some time before it was killed.

Temperature.



Weights.

The calf grew very little during the experiment.

	cwts.	qrs.	lbs.	
December 7th, 1905 - -	1	0	3	Inoculated.
March 8th, 1906 - - -	1	0	14	Killed.

Total gain of weight during experiment.—11 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Poor.

At the Seat of Inoculation.—On the right side of the neck was a nodular swelling with a depression, evidently an old sinus, covered by a scab. On section the skin was seen to be thickened and puckered, and the subcutaneous tissue over an area of $3\frac{1}{2}$ in. by $1\frac{3}{4}$ in. was dense and packed with calcareous grains, with here and there a little patch of softened caseous matter.

The Right Prescapular Gland.—was slightly enlarged, and contained several pea-sized calcareous nodules.

The Right Prepectoral Gland.—Was normal.

The Left Prescapular and Axillary Glands.—Were normal.

Pleura.—Normal.

Lungs.—The anterior lobes of each lung were carnified, and many tortuous vessels could be seen on the surface of the affected parts. The rest of the lung was normal.

Thoracic Glands, Heart and Pericardium, Omentum and Peritoneum, Intestines, Mesenteric Glands, Spleen, Liver, Hepatic Glands.—Normal.

Kidneys.—In two of the calyces of the left kidney were little collections of gravel. The neighbouring kidney substance was atrophied. Right kidney normal.

Suprarenals; Renal, Lumbar, and Iliac Glands.—Normal.

Eyes.—Normal.

Testes.—Normal.

Various Lymphatic Glands.

Precrural, Pubic, Gluteal and Ischiatic, Popliteal, Submaxillary and Subparotid, Post-Pharyngeal and Hyoid.—Normal.

Tongue, Pharynx, Palate, Tonsils.—Normal.

PIG 21. (Virus H 56. "F.T.")

Subcutaneous Inoculation of culture derived from human lung through Guinea-Pig 1682.

Dose—1·0 milligramme.

Date—March 20th, 1906.

Weight at Inoculation—1 qr. 24 lbs.

Killed—June 26th, 1906. (98 days after inoculation.]

Weights.

	qrs.	lbs.	
March 20th, 1906 - -	1	24	Inoculated.
June 26th, 1906 - -	3	7	Killed.

Total gain of weight during experiment—1 qr. 11 lbs.

POST-MORTEM EXAMINATION.

General Condition.—Good.

At the Seat of Inoculation.—In the abdominal wall to the left of the middle line was a small swelling containing a soft caseous nodule 1 in. by 1 in. by $\frac{1}{2}$ in., surrounded by fibrous tissue.

The Precrural Gland just above it was normal, but the *Left Inguinal Gland* was enlarged and contained a caseo-necrotic and partly softened nodule 1 in. in diameter, and a smaller nodule the size of a pea.

The Right Precrural and Inguinal Glands.—Were normal.

Peritoneum, Intestines.—Normal.

Abdomen.

Mesenteric Glands.—In these glands were found four minute caseous foci.

Spleen.—Two minute caseous tubercles were found in the spleen, after it had been cut into many thin slices. They readily shelled out, and were found to be softened.

Liver.—Two similar tubercles were seen on the surface of the liver.

Portal Glands.—Normal.

Kidneys and Suprarenals.—Normal.

Iliac and Lumbar Glands.—Normal.

Thorax.

Pleura.—Normal.

Lungs.—The lungs showed a moderate number of little tubercles scattered over their surfaces, and a few were seen also on section. They were of a dark reddish colour with a soft dry caseous centre, which readily shelled out. They were small, so that few of them attained a diameter of $\frac{1}{8}$ in. In number they were just countable, there being between 200 and 250 on the surface of each lung. They were not numerous or large enough to interfere seriously with the function of the organ, and they appeared to have set up no disturbance in their neighbourhood.

The Bronchial Glands.—Were normal.

Heart.—Normal.

Genito-Urinary System.

Uterus.—Normal.

Tongue, Pharynx, and Palate.—Normal.

Larynx and Trachea.—Normal.

Submaxillary Lymphatic Glands.—Normal.

Microscopical Examination.

Focus from Mesenteric Gland.—No tubercle bacilli seen.

Focus from Liver.—No tubercle bacilli seen.

Focus from Spleen.—One tubercle bacillus seen.

PIG 23. (Virus H 56. "F.T.")

Subcutaneous Inoculation of culture derived from human lung, through Guinea-Pig 1682.

Dose—50 milligrammes.

Date—March 20th, 1906.

Weight at Inoculation—1 qr. 17 lbs.

Killed—May 24th, 1906. [65 days after inoculation.]

Weights.

	qrs.	lbs.
March 20th, 1906	1	17
May 24th, 1906	2	3

Total gain of weight during experiment—14 lbs.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—The seat of inoculation was on the left side of the abdominal wall near the groin. In this region the skin was slightly puckered, but there was no ulcer, and no definite sign of any pre-existing ulcer. Over an area of about two inches in diameter the skin was thickened and dense, and contained yellow calcareous grains.

In the immediate neighbourhood of the local lesion were two caseous lymphatic glands about half an inch in diameter.

Inguinal Glands.—Those on the left side were enlarged two of them measuring an inch and a quarter in longest diameter. One was caseous throughout, another contained caseous nodules, while a third smaller gland was normal. The right inguinal glands were normal.

Abdomen.

Peritoneum, Omentum.—Normal.

Intestines.—Normal.

Mesenteric Glands.—In the mesenteric glands, which were normal in size, were a few opaque specks. These were picked out for microscopic examination.

Spleen.—Normal.

Liver.—The liver was faintly mottled on the surface, but showed no sign of tubercle.

Portal Glands, Kidneys, Suprarenals, Lumbar Glands, Iliac Glands.—Normal.

Thorax.

Pleura.—Normal.

Lungs.—The lungs showed an extensive pinkish-grey mottling, and the left one in particular was unusually firm. The marginal fringes and tufts on the surface of the lung were greatly hypertrophied, and here and there contained minute translucent grey tubercles. The surface of each lung was somewhat nodular, the appearance being caused by numerous little translucent grey elevations, probably tubercles. The grey mottling seemed to be caused by similar, but smaller, bodies, which had not projected beyond the surface.

Section showed rather numerous little translucent tubercles, similar to those on the surface, and situated for the most part close to the pleura. These were difficult to see clearly on account of their having no central opacity, because they were very much the same colour as the rest of the lung. They were like the tubercles seen in the lungs of some of the calves injected with viruses of Group II. From their great translucency Dr. Cobbet did not think they could possibly be progressing tubercles. Portions of the anterior lobes of the lungs were carnified.

Trachea, Bronchial Glands, Heart.—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Axillary, Submaxillary, Subparotid, Post-Pharyngeal, Hyoid.—Normal.

Tongue, Pharynx.—Normal.

Microscopical Examination.

Translucent Tubercles from Lung.—Tubercle bacilli scanty.

Focus from Mesenteric Gland.—No tubercle bacilli.

PIG 25. (Virus H 56. "F.T.")

Fed with culture derived from human lung through Guinea-Pig 1682.

Dose—50 milligrammes.

Date—March 20th, 1906.

Weight when fed—1 qr. 16 lbs.

Killed—June 26th, 1906. [98 days after feeding.]

Weights :

	qrs.	lbs.
March 20th, 1906 - - - -	1	16
June 26th, 1906 - - - -	2	20

Total gain of weight during experiment—1 qr. 4 lbs.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Alimentary Tract.

The Tongue and Pharynx, including the glandular tissue of the palate, were normal.

Larynx and Trachea.—Normal.

The Submaxillary Gland on the right side contained a dry calcareous nodule the size of a pea, and several smaller foci.

The left submaxillary gland contained a caseo-calcareous nodule, ¾ in. in diameter, and a gland a little higher up, possibly the parotid, contained a calcareous focus.

The Small and Large Intestine.—Normal.

The Mesenteric Glands contained dry caseous and sligh 'y calcareous foci. These were absent in some, present in the great majority, and rather numerous in some of the glands, especially towards one end of the mesentery. Some of them were ⅛ in. to ¼ in. in diameter ; they were to a great extent softened, and they shelled out very readily, being surrounded by apparently normal tissue, recalling the crypts in the normal tonsil of the calf, when the former are filled with pultaceous contents.

Abdomen.

Peritoneum.—Normal.

Spleen.—Normal.

Liver.—Normal.

Portal Glands.—Normal.

Kidneys.—Normal.

Suprarenals.—Normal.

Lumbar and Iliac Glands.—Normal.

Thorax,

Pleura.—Normal.

Lungs.—Three little tubercles were seen in the right lung, each with a minute caseous centre. The left lung was normal.

Bronchial Glands.—There were several small caseous foci in a left bronchial gland. The right appeared to be normal.

Heart.—Normal.

Precrural Glands.—Normal.

PIG 27. (Virus H 56. "F.T.")

Fed with culture derived from human lung, through Guinea-Pig 1682.

Dose—1·0 milligramme.

Date—March 20th, 1906.

Weight when fed—1 qr. 23 lbs.

Killed—June 27th, 1906. [99 days after feeding].

Weights

	qrs.	lbs.
March 20th, 1906 - - - -	1	23
June 27th, 1906 - - - -	3	0

Total gain of weight during experiment.—1 qr. 5 lbs.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Alimentary Tract.

Tongue, Pharynx, and Palate.—Normal.

Larynx and Trachea.—Normal.

The Submaxillary Glands on each side were enlarged, and they were principally composed of large nodules of softened caseous matter containing very few minute calcareous grains. The caseous matter easily shelled out, leaving a cavity the walls of which were composed of apparently unaltered gland tissue.

A Gland situated just posterior to the root of the left styloid process was slightly enlarged, and contained some small caseous nodules similar to those in the submaxillary glands.

Intestines.—The small and large intestines were normal.

Mesenteric Glands.—Two of these glands contained one or two small caseous nodules about one-eighth of an inch in diameter.

Abdomen

Peritoneum.—Normal.

Liver.—Normal.

Portal Glands.—Normal.

Spleen.—Normal.

Kidneys.—Normal.

Suprarenals.—Normal.

Iliac and Lumbar Glands.—Normal.

Thorax:

Pleura.—Normal.

Lungs.—The lungs appeared at first sight perfectly healthy, but on close inspection three little grey fibrous foci, possibly tubercles, were seen, about one sixteenth of an inch in diameter.

Heart.—Normal.

Bronchial Glands.—Normal.

Various Lymphatic Glands.

Precrural.—Normal.

Axillary.—Normal.

Microscopical Examination.

(?) *Tubercle from Lung.*—No tubercle bacilli seen.

BABOON 1. (Virus H 56. "F.T."

Fed with culture derived from human lung, through Guinea-Pig, 1682.

Dose—1·0 milligramme.

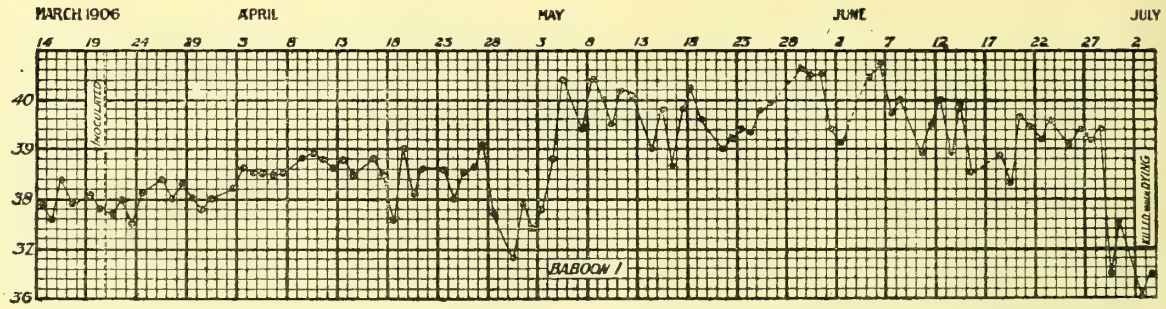
Date—March 20th, 1906.

Killed—When dying, July 5th, 1906. [108 days after feeding.]

Clinical Notes.

The baboon was fed on March 20th, 1906. It slowly became ill and thin, and was killed when in a dying condition on July 5th, 1906, 108 days later.

Temperature.



Tuberculin Test.

The baboon was not tested subsequent to infection.

POST-MORTEM EXAMINATION.

Alimentary Tract.

Tongue, Palate.—Normal.

Tonsils.—Each tonsil contained a caseating network.

Pharynx.—There were one or two caseous tubercles in the pharyngeal muscles.

Larynx.—Was congested, but showed no tubercles.

Submaxillary Glands.—Were caseous, and commencing to soften. One gland on each side was ¾ in. long.

Salivary Glands.—Normal.

Cervical Glands.—The deep cervical glands were very greatly enlarged and caseous, and to a great extent broken down into purulent fluid. This was particularly the case with a group of glands near the upper and posterior part of the pharynx (posterior pharyngeal or hyoid in the calf) on each side, which formed large irregular masses which were partly broken down, especially on the left side, into caseous abscesses.

There was a group of caseous glands just above the left clavicle.

Intestines.—Normal.

Mesenteric Glands.—Were not so severely affected as the cervical. One only was enlarged, ½ in. in diameter, and caseous.

Abdomen.

Omentum.—There were many round yellow tubercles loosely attached to the omentum, especially along the vessels.

Peritoneum.—On the peritoneal surface of the diaphragm were flattened tuberculous plaques, which formed large irregular greyish areas studded with yellow points. These tuberculous patches were adherent to the liver, and they extended into the muscular substance of the organ, and were just visible from the pleural surface.

Spleen.—Was not enlarged. It contained a caseous and partly softened nodule ½ in. in diameter.

Liver.—Showed a moderate number of flattened grey tubercles, studded with yellow points, on the surface. Some of these were ¼ in in diameter, but others were smaller, and joined together, so as to form very irregular areas. These had thin grey margins, which spread themselves between the liver and diaphragm. Besides these larger tubercles were some smaller ones, more deeply situated. On section a small number of caseous tubercles were seen.

Portal Glands.—A gland in the portal fissure contained caseous foci.

Kidneys.—Several fibro-caseous tubercles were seen on the surface of the right. Two little only were seen on that of the left.

Suprarenals.—Normal.

Lumbar Glands.—Two lumbar glands contained caseous nodules.

Thorax.

Pleura.—There were many little early tubercles, rather translucent, on the pleura.

Lungs.—Were packed with large nodules, ½ in. in diameter, which projected from the surface when the organs collapsed. On section the lungs were found to be filled with caseous nodules with grey translucent margins. Many were as large as peas, and many also were larger, even ½ in. in diameter. One in the base of the right lung measured nearly 1 in.

Trachea.—Was congested; its mucous membrane was roughened, but free from tubercles.

Thoracic Glands.—Were moderately enlarged, and contained caseous tubercles, and fibrous nodules packed with caseous foci.

Heart.—Normal.

Genito-Urinary System.

Uterus, Ovaries.—Normal.

Special Glands.

Axillary.—Normal.

Inguinal.—The right inguinal gland was caseous.

Popliteal.—The right contained a caseous nodule. The left was normal.

Brain, Eyes.—Normal.

Thyroid Gland.—Normal.

BABOON 3. (Virus H 56. "F.T.")

Subcutaneous Inoculation of culture derived from human lung, through Guinea-pig 1682.

Dose—1·0 milligramme.

Date—March 20th, 1906.

Died—April 27th, 1906. [38 days after inoculation.]

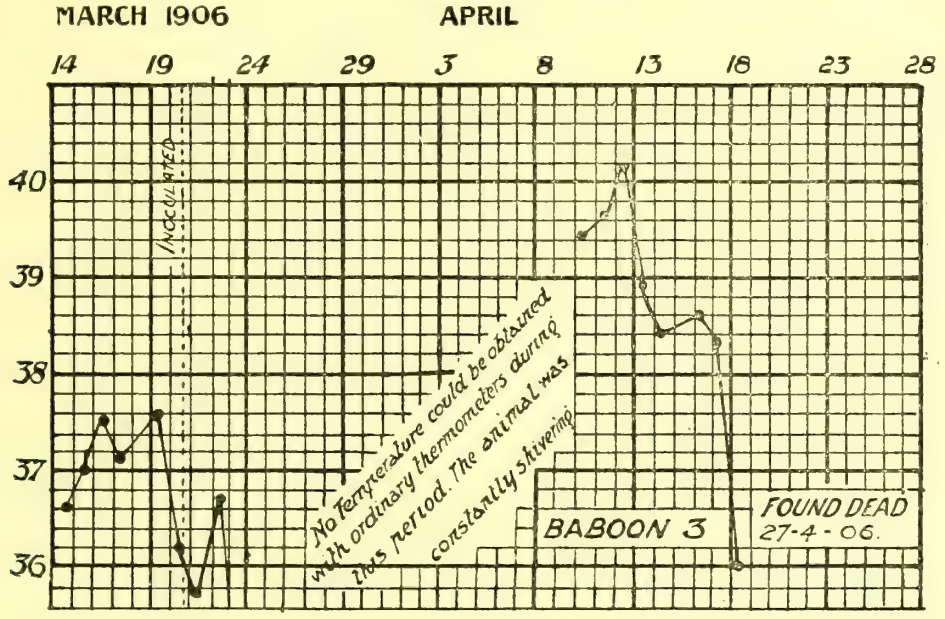
Clinical Notes.

On arrival at Blythwood the baboon was observed to be ill, constantly shivering, and very loth to move, as though stiff. The temperature for the first fortnight was subnormal; during the first week it was mostly 36·0°C. After being here a fortnight the animal improved a little in general health, its temperature being usually between 37°, and 38·0°C. A tuberculin test was made at this period, the dose being 2·0 cc. This resulted in a sharp fall of temperature to 35·5°C, followed by a slight rise to 38·0° C.

The animal was injected on March 20th, subcutaneously, between the shoulders, with 1·0 mg. of culture. A few days after injection the temperature fell so low that the clinical thermometer was unable to record it (*i.e.* less than 35·0°C). It continued unrecordable until 21 days after injection, during which time the animal was constantly shivering, its general appearance being very like that soon after its arrival. A swelling appeared at the seat of inoculation, but did not seem to give rise to any inconvenience. There was no cough, no definite symptoms except stiffness and shivering; the animal's nose was always very dry.

On the 21st day after injection the first temperature was recorded at 39·4°C. After this it continued high for about a week; the highest temperature recorded being 40·1°C. on the 23rd day. At this time the animal appeared a good deal better. From the 23rd day the temperature fell; on the 28th day it was 38·3°C.; on the 29th it was 36·0°C., and the animal again appeared ill, though no worse than before the febrile rise. From the 30th day onwards the temperature was unrecordable, with the exception that 36·0°C. was registered on the 35th day. On the 38th day (April 27th) the animal was found to be dead.

Temperature.



Tuberculin Test.

The baboon was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Fair.

At the Seat of Inoculation, between the shoulders, was a fluctuating swelling in the subcutaneous tissue, surmounted by a dry crust, which sealed a small opening. When this was removed, a thin purulent fluid ran out, measuring 30 cc. On removing the skin the abscess adhered to it, and could be cleanly dissected off the subjacent muscle. From its internal aspect it measured 4½ in. by 2¼ in.

The Axillary Glands were much enlarged and suppurating. On the right side was a gland about 1¼ in. in diameter, another the size of a sparrow's egg, and several smaller.

The large gland was composed of translucent pinkish-grey matter, punctuated with numerous caseous spots, and with some larger softened caseous areas. The other glands were similar, but not softened.

On the left side the glands were similar; the larger one, not more than 1 in. in diameter, was more extensively softened.

On the right side above the clavicle in the posterior triangle, there was a softened caseous gland, as large as a sparrow's egg.

There was no corresponding gland on the left side.

The Inguinal and Submaxillary Glands were all rather large, but they were not tuberculous.

Thorax.

On many of the ribs seen from the pleural surface were slight projections situated in a single line on either side, and affecting almost all the ribs on the right side and several on the left. These projections formed curved lines which closely followed those formed by the sternal ends of the ribs, being situated from 1 in. to 1½ in. from these ends.

The two portions into which a rib containing a bulging or projection was divided, were often situated at a slight angle one to the other, and there was found to be considerable flexibility at these bulgings. In some of the ribs the place corresponding to a projection in its neighbour was taken by a pale patch where there was undue flexibility.

Stripped of the periosteum, these projections were found to be due to a depression of the ribs inwards, and there was very little expansion at these points. A longitudinal section showed to the naked eye that the medullary cavity, for a distance of about ¼ in., was obliterated, the whole thickness being formed of the same soft fibrous bony tissue. The cause of this condition could not be determined.

The Lungs were somewhat emphysematous, especially at the margins. They were faintly mottled with minute angular pigment points, uniformly distributed. In addition there were a good many spots of dark reddish-purple. There were no projections on the surface, and no nodules could be felt in the substance of either lung. Section revealed a minute grey tubercle about 1 mm. in diameter in the upper lobe of the right lung.

Bronchial Glands.—A few small grey tubercles with opaque centres were seen in these glands.

Heart.—Normal.

Abdomen.

Omentum and Peritoneum.—Normal.

Intestines.—In the small intestine three minute depressions were seen—small ulcers (?)—each surrounded by a zone of congestion. In one of them the base of the supposed ulcer was solid and whitish. The first of these little ulcers was a yard from the pylorus.

The large intestine was normal, except for slight congestion on the prominent part of the ridges of the mucous membrane.

Mesenteric Glands.—Were slightly enlarged, the majority of them being the size of haricot beans, some a little larger. All contained numerous little caseous foci.

Spleen.—Was probably not enlarged, or at least not much enlarged. On its surface were seen several small elevations, but otherwise it appeared normal. On section a dozen or more small grey tubercles were seen. Some of these were just under the capsule, and had caused the elevations referred to above.

Liver.—On the surface of the liver were seen a number of very small grey tubercles. These were not very conspicuous at first sight, but on close inspection about thirty could be counted on the upper surface, nearly fifty on the lower. On section the tubercles were seen scattered throughout the organ, but somewhat sparsely.

Kidneys.—In the right kidney two small grey tubercles were seen on the surface. No additional ones were seen on section. None were seen in the left.

Coeliac Glands.—Were still more enlarged than the mesenteric, one of them being about 1 in. in diameter. It was composed of grey translucent tuberculous tissue, thickly peppered with caseous points.

Genito-Urinary System.

Uterus.—Normal.

Tongue, Pharynx.—Normal.

Brain and Membranes.—The dura mater showed numerous small hæmorrhages on its surface. The vessels of the pia mater were congested. There was an excess of fluid about the brain and in its ventricles, and the latter were somewhat distended.

Microscopical Examination.

Tubercle from Lung.—Three tubercle bacilli seen,

Bronchial Gland.—Tubercle bacilli.

Tubercle from Spleen.—Tubercle bacilli scanty.

Little (?) ulcer from Intestine.—No tubercle bacilli.

Another, with caseous base.—Tubercle bacilli, four or five seen.

PIG 37. (Virus H 56. "F.T.")

Fed with culture derived from human lung, through Guinea-pig 1682.

Dose—50 milligrammes.

Date—May 28th, 1906.

Weight at commencement of Experiment—2 qrs. 7 lbs.

Killed—August 27th, 1906. [91 days after feeding.]

Weights.

	qrs.	lbs.
28th May, 1906 - - - - -	2	7
27th August, 1906 - - - -	3	21

Total gain of weight during experiment.—1 qr. 14 lbs.

POST MORTEM EXAMINATION.

General Condition.—Fat.

Pharynx.—Normal.

Submaxillary Glands.—The submaxillary glands on both sides were slightly enlarged, and contained shot-sized caseous and softened tubercles, the intervening gland tissue appearing to be normal.

Subparotid Glands, Hyoid Glands.—Normal.

Intestines.—Normal.

Mesenteric Glands.—Were all slightly enlarged, and similar to the submaxillary.

Abdomen.

Peritoneum, Omentum.—Normal.

Spleen, Liver.—Normal.

Portal Glands.—Contained a few caseous foci.

Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Thorax.

Pleura.—Normal.

Lungs.—In each lung were found two shot-sized tubercles, grey and translucent, with more or less opacity in their centres.

Bronchial Glands, Heart.—Normal.

Genito-Urinary System.

Uterus.—Normal.

Special Glands.

Prescapular, Axillary, Precrural.—Normal.

Microscopical Examination.

Mesenteric Gland (tubercle from) { (1). One tubercle bacillus seen. (2). Tubercle bacilli.

PIG 43. (Virus H 56. "F.T.")

Subcutaneous Inoculation of culture derived from human lung, through Guinea-Pig 1682.

Dose—50 milligrammes.

Date—May 28th, 1906.

Weight at Inoculation—2 qrs. 11 lbs.

Killed—August 27th, 1906. [91 days after inoculation.]

Weights.

	qrs.	lbs.
May 28th, 1906 - - - -	2	11
August 27th, 1906 - - - -	3	19

POST-MORTEM EXAMINATION.

General Condition.—Fat.

Local Lesion.—At the seat of inoculation, in the abdominal wall, was a small nodule the size of a gooseberry, under the skin. It was caseo-necrotic, partly calcified and partly softened.

Precrural Glands, Pubic Glands.—There were several precrural and pubic glands, about the same size as the local lesion, and similar in structure.

Abdomen.

Peritoneum, Omentum, Intestines, Mesenteric Glands, Spleen, Liver.—Normal.

Portal Glands.—Contained a few small caseous foci.

Kidneys, Suprarenals.—Normal.

Renal Glands, Lumbar Glands.—Contained a few minute foci.

Iliac Glands.—The right contained two little groups of caseous foci. The left was normal.

Thorax.

Pleura.—Normal.

Lungs.—The lungs contained a moderate number of little translucent tubercles, some of which had minute opaque centres. They were difficult to see, and more readily felt. They resembled the tubercles often seen in calves injected with viruses of Group II.

Bronchial Glands.—In the bronchial glands were a few small caseous foci.

Heart.—Normal.

Genito-Urinary System.

Uterus.—Normal.

Special Glands.

Prescapular, Axillary, Submaxillary, Hyoid.—Normal.

Tongue, Palate, Pharynx.—Normal.

VIRUS H 57. "B.J."

LUNG AND MESENTERIC GLANDS. (Post-mortem.)

CULTURE INOCULATIONS.

MESENTERIC GLANDS.

March 22, 1906.

Strain derived from human mesenteric glands, through Guinea-Pig 1802.

Total duration of artificial cultivation : 2½ months.

Cultures used for injection : 4th and 5th, 21 and 9 days old respectively, on bovine serum.



BULL-CALF 981.

Subcutaneous.

Dose : 50 mg.

Killed, June 27, 1906.

97 days.

P.M.—Small local tumour. Prescapular gland calcareous. Three minute tubercles in lung. One or more calcareous foci in two bronchial and two mesenteric glands. **(S.T.)**

RABBITS.

820	10 mg.	K. 98 days	Slight chronic tuberculosis of peritoneum and kidneys.
821	10 mg.	„ 98 „	One little tubercle in lung. Tuberculous abscess in cæcum.

FOWL 6. [P.]

10 mg.

Killed, 147 days.

T.B. found in spots on peritoneum. All organs normal.

FOWL 7. [P.]

10 mg.

Killed, 147 days.

Normal throughout.

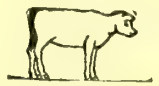
LUNG.

April 24, 1906.

Strain derived from human lung, through Guinea-Pig 1800.

Total duration of artificial cultivation : 3½ months.

Culture used for injection : 5th, 21 days old, on bovine serum.



BULL-CALF 1065.

Subcutaneous.

Dose : 50 mg.

Killed, July 26, 1906.

93 days.

P.M.—Local ulcer. Prescapular gland calcareous. Two very minute foci in lungs. Popliteal glands packed with caseous tubercles. Many other lymphatic glands contain one or more tubercles each. **(S.T.)**

RABBIT 948 was injected with a culture raised from the popliteal gland. It was killed 31 days later, and was found to have minimal lesions only.

RABBITS.

860	10 mg.	K. 105 days	Chronic tuberculosis of omentum. Abscess in abdominal wall.
861	1 mg.	D. 1 day	No tuberculosis.

VIRUS H 57. "B.J."

B.J., Female Child aged twelve months, admitted to Hospital November 26th, 1905, suffering from Meningitis. Died December 17th, 1905.

Family History.—The patient was an only child, and there was no history of tubercle in the family.

Clinical History.—The child had suffered from convulsions when a fortnight old, these attacks recurring a month later, but they had not been noticed subsequently till November 16th. There had been nine separate attacks previous to admission. The child had been wasting for two months. The child had been suckled by its mother for two weeks after birth, and had then been fed for a short time on sterilised milk, this food being subsequently changed to various artificial preparations.

On admission the child was pale and thin, the head was retracted and the legs flexed. Enlarged glands, which were freely movable, could be detected on both sides of the neck. There was harsh vesicular breathing over both lungs, and the abdomen was tense and full.

The child gradually got worse, and died twenty-three days after admission.

POST-MORTEM EXAMINATION.

There were no scars in the neck, but some enlarged cervical glands were found on both sides.

Thorax.

Lungs.—Were full of small miliary tubercles, but contained no cavities.

Bronchial Glands.—Enlarged and caseating.

Abdomen.

Peritoneum.—Apparently normal.

Intestines.—Contained numerous ulcers.

Mesenteric Glands.—Enlarged and caseating.

Spleen.—Showed no visible tubercles.

Liver.—Contained a few grey tubercles.

Kidneys.—Showed a few caseating patches.

Meninges of Brain.—No definite tubercles could be seen on the meninges, but a few small papillomata (possibly tuberculous) were seen on the pia mater.

Bones and Joints.—Healthy.

DESCRIPTION OF MATERIAL RECEIVED AT BLYTHWOOD.

The bronchial, cervical, and mesenteric glands; portions of lung, liver, spleen, and kidney.

Mesenteric Glands.—Numerous enlarged glands, varying in size from a large shot to a small haricot bean. They were uniformly cream-coloured and caseating, but fairly firm in structure, breaking down with difficulty when scraped, and showing no points of softening and no calcification.

Cervical Glands.—Contained caseating foci similar to the mesenteric.

Bronchial Glands—One gland contained some small early caseating patches.

Lung.—The small portion of lung received was consolidated, dark pink in colour, and packed with little greyish white points. There were no cavities, and no definite caseous patches.

Liver.—The small portion of liver received showed one small tuberculous focus on the capsule.

Spleen.—Showed no tubercles in the small portion received.

Kidney.—Only a small portion of kidney was received. This was very pale in colour, but contained no tubercles.

Microscopical Examination.

Emulsion of Lung.—Contained very numerous tubercle bacilli, long, curved, and uniformly stained.

Emulsion of Mesenteric Glands.—Contained very numerous tubercle bacilli, long, curved, and uniformly stained.

Emulsion made from Liver.—No tubercle bacilli could be found.

Emulsion made from Spleen.—No tubercle bacilli could be found.

CALF 981. (Virus H 57. "B.J.")

Subcutaneous Inoculation of culture derived from human mesenteric glands through Guinea-Pig 1802.

Dose—50 milligrammes.

Date—March 22nd, 1906.

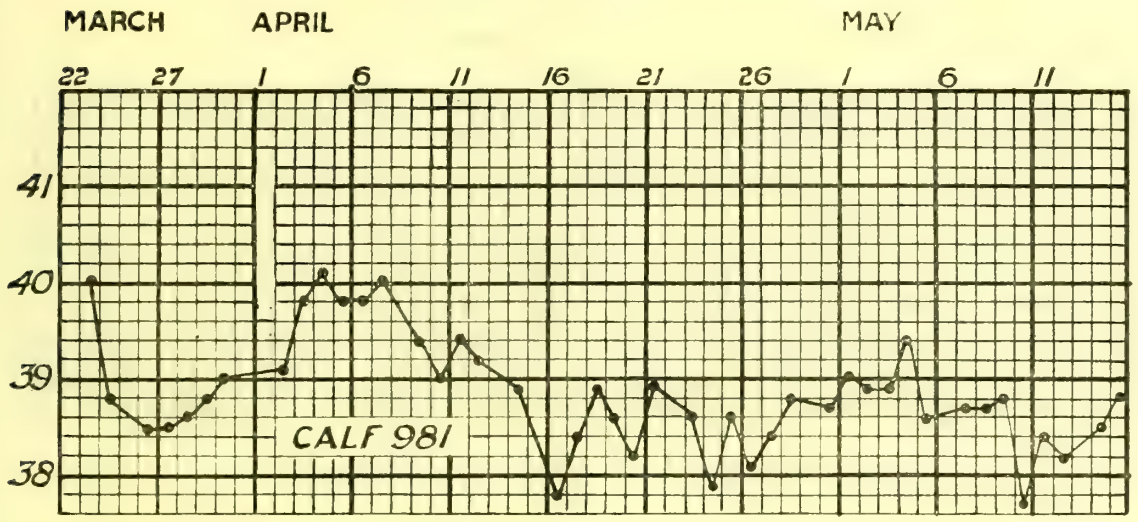
Weight at Inoculation—2 cwts. 0 qr. 10 lbs.

Killed—June 27th, 1906. [97 days after inoculation.]

Clinical Notes.

The calf was inoculated on March 22nd, 1906. The development of the tumour at the seat of inoculation and of the neighbouring prescapular gland was similar to that usually seen in calves injected with viruses of Group II. The calf remained well, and was killed June 27th, 97 days after inoculation.

Temperature.



From May 16th to June 27th the temperature remained normal, with the exception of a sudden and unaccountable rise during the last week.

Tuberculin Test.

March 30th. 8 days after inoculation. Reacted. Rise of temperature 1·4° C.

Weights.

	cwts.	qrs.	lbs.
March 22nd, 1906 - -	2	0	10
June 27th, 1906 - - -	2	1	25

Total gain of weight.—1 qr. 15 lbs.

Rate of gain per week.—3·1 lbs.

POST-MORTEM EXAMINATION.

General Condition.—Good.

At the Seat of Inoculation.—On the right side of the neck was a small prominent oval fluctuating swelling 3¼ in. by 1¾ in. by 1 in., weighing 3 ozs.

It consisted of softened caseous matter enclosed in a fibrous capsule.

The Right Prescapular Gland.—Was slightly enlarged, 2½ in. long. It consisted principally of two very hard and calcareous nodules, the larger nearly 1½ in. in longest diameter.

The Right Prepectoral Gland.—Was normal.

The Left Prescapular and Axillary Glands.—Were also normal.

Thorax.

Pleura.—Normal.

Lungs.—On the diaphragmatic surface of the left lung were seen three minute pearly grey tubercles. One of these was readily picked out on the point of a knife, and cracked when crushed on a coverslip.

The lungs were otherwise perfectly healthy.

The Thoracic Glands.—Were not at all enlarged. After a good deal of search an exceedingly minute calcareous speck was found in the cortex of the left bronchial gland, and another in the right. The long thoracic gland was normal.

Heart.—Normal.

Alimentary Tract.

Tongue, Pharynx, Palate, Tonsils.—Normal.

Larynx and Trachea.—Normal.

Intestines.

Mesenteric Glands.—In two of these glands one or two minute calcareous foci were found immediately under the capsule. The other glands were normal.

Abdomen.

Peritoneum, Spleen, Liver, Portal Glands, Kidneys, Suprarenals, Iliac and Lumbar Glands, Renal Glands, Testes.

Various Lymphatic Glands.

Precrural and Popliteal.—Normal.

Gluteal and Ischiatic.—Normal.

Pubic.—Normal.

Posterior-Pharyngeal and Hyoid.—Normal.

Submaxillary and Subparotid.—Normal.

Microscopical Examination.

Mesenteric Gland, Focus from.—No tubercle bacilli seen.

Thoracic Gland, Focus from.—One tubercle bacillus seen.

CALF 1065. (Virus H 57. "B.J.")

Subcutaneous Inoculation of culture derived from human lung through Guinea-Pig 1800.

Dose—50 milligrammes.

Date—April 24th, 1906.

Weight at Inoculation—3 qrs. 18 lbs.

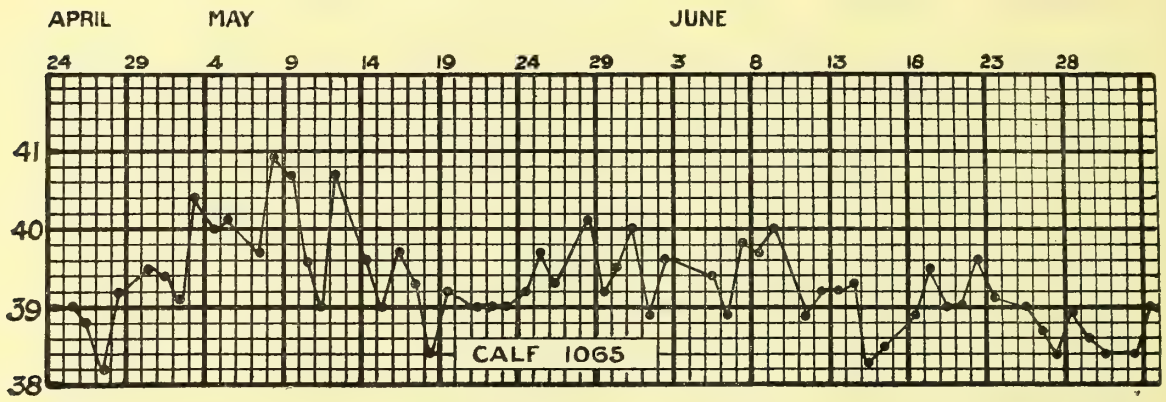
Killed—July 26th, 1906. [93 days after inoculation.]

Clinical Notes.

The calf was inoculated on April 24th, 1906. It suffered from the usual constitutional disturbance during the first month. The temperature rose to 40·9° C. on the 14th day and remained high for a considerable period.

The calf recovered its normal health and appearance during the second month, and was in good condition when killed on July 26th, 93 days after inoculation.

Temperature.



After the end of June the temperature remained practically normal.

Weights.

	cwts.	qrs.	lbs.
April 24th, 1906 - - -	0	3	18
July 26th, 1906 - - -	1	0	21

Total gain of weight.—1 qr. 3 lbs.

Rate of gain per week.—2·4 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

At the Seat of Inoculation.—On the right side of the neck, was a small swelling with a central ulcer covered by a crust. The walls of the ulcer were composed of fibrous tissue infiltrated with caseous and calcareous grains.

The Right Prescapular Gland.—Was moderately enlarged, and was principally composed of two dense and very calcareous nodules.

The Prepectoral Gland.—Was normal.

The Left Prescapular and Axillary Glands.—Were normal.

Thorax.

Pleura.—Normal.

The Lungs.—Were healthy. Two very minute wholly translucent grey foci were found in them.

Thoracic Glands.—Normal.

Heart.—Normal.

Alimentary Tract.

Tongue, Pharynx, Palate, Tonsils.—Normal.

Intestines.—Several small yellow pultaceous points were seen, probably not tubercles.

Mesenteric Glands.—In one or two glands was found a minute calcareous grain.

Abdomen.

Peritoneum.—Normal.

Spleen.—Normal.

Liver.—Normal.

Portal Glands.—One contained a small focus.

Kidneys.—Normal.

Suprarenals.—Normal.

Renal, Lumbar, and Iliac Lymphatic Glands.—Normal.

Testes.—Normal.

Various Lymphatic Glands.

Both Popliteals.—Were packed with caseous tubercles of the size of small shot.

Right Precrural, both Gluteals, and Left Ischiatic.—Each contained a tubercle.

Left Precrural and Right Ischiatic.—Normal.

Axillary.—Normal.

Right Submaxillary and both Subparotid.—Contained a few caseous tubercles.

Left Submaxillary, both *Posterior-Pharyngeal and Hyoid.*—Normal.

VIRUS H 58. "F. G."

CERVICAL GLANDS and LUNG. (Post-mortem)

VIRUS H 58. "F.G."

CULTURE INOCULATIONS.

CERVICAL GLANDS.

May 2, 1906.

Strain derived from human cervical glands, through G.P. 1,816.

Total duration of artificial cultivation, 2 months.

First sub-culture used for inoculation, 21 days old, on glycerin-serum.



BULL-CALF 1,075.

Subcutaneous.

Dose: 80 mg.

Killed, August 4, 1906.

(94 days.)

P.M.—Abscess tumour at seat of inoculation; calcareous grains in nearest lymphatic gland. (L.T.)

RABBITS.

867	1·mg.	K. 97 days	No tuberculosis.
868	1·mg.	„ 97 „	Trace of tuberculosis in abdominal wall.

LUNG.

March 23, 1906.

Strain derived from human lung, through G.P. 1,812.

Total duration of artificial cultivation, 1 month.

Sub-culture used for inoculation, 21 days old, on pure bovine serum.



BULL-CALF 985.

Subcutaneous.

Dose: 50 mg.

Killed, June 27, 1906.

(96 days.)

P.M.—Small local lesion. Prescapular gland fibro-calcareous and partly softened. One minute tubercle in lung. (S.T.)

RABBITS.

822	1·mg.	K. 97 days	Slight chronic tuberculous peritonitis, trace in kidneys.
823	10·mg.	„ 97 „	Chronic tuberculosis of peritoneum and kidneys.

VIRUS H 58. "F.G."

F.G., Female, aged Twenty-two, Admitted to Hospital July 12th, 1905, suffering from Phthisis. Died January 5th, 1906.

Family History.—Unknown.

Clinical History.—The patient was first admitted to hospital on March 8th, 1904, when she had suffered from cough for three months, with expectoration, at times streaked with blood. There had also been loss of flesh. Signs of consolidation were found at the left apex.

She was re-admitted on July 12th, 1905, when both apices were found to be affected. She got worse very gradually, and died about six months later.

POST-MORTEM EXAMINATION.

On both sides of the neck were the scars of wounds, due to removal of cervical glands three years previously in another hospital.

Thorax.

Lungs.—Cavities were found in both apices, the pleura on the left side being adherent.

Bronchial Glands.—Enlarged.

Abdomen.

Peritoneum and Intestines.—Healthy.

Mesenteric Glands.—Slightly enlarged.

Spleen and Liver.—Healthy.

Kidneys.—Large and pale.

Bones and Joints.—Healthy.

DESCRIPTION OF MATERIAL RECEIVED AT BLYTHWOOD.

Cervical Glands.—Two lower cervical glands were received; one about the size of a flattened pea, contained a small calcareous lesion, so hard as to be with difficulty broken between ground glass plates. The other was slightly smaller, and contained numerous small caseous points.

It appeared from the examination of these glands that the lesions found in one were much more recent than those in the other.

Mesentery.—There was a considerable amount of fat in the mesentery, and the glands, as seen through it, appeared to be a good deal enlarged. When dissected out, however, none seemed much larger than normal. All were soft, the only tuberculous lesions being occasional small caseous foci just under the capsule.

Thoracic Glands.—The post-mediastinal gland was about the size of a broad bean. It was moderately soft, and showed no definite signs of being tuberculous. A gland lying just below the right bronchus was enlarged, pigmented, and contained a small calcareous focus. Several glands lying lower down, and to the left of the oesophagus, were enlarged, pigmented, and rather dense, but contained no caseous or calcareous foci.

Lungs.—Were not collapsed, and had a somewhat nodular appearance. The upper lobe of the left lung was almost entirely occupied by a large irregular cavity, which had been torn open in removing the organ. There was another very large cavity, measuring some 3 in. in length, in the posterior part of the lung, behind the left bronchus. It contained a large quantity of reddish-brown purulent fluid. There were also a few small cavities in its neighbourhood. The lower lobe of the lung was dense and pigmented. It contained sparsely scattered miliary tubercles, and when squeezed purulent fluid exuded from what appeared to be the bronchi. The whole of the right upper lobe consisted of a large irregular cavity, containing brownish-red purulent fluid. The cavity had a thin fibrous wall, with pigmented lining, and showed here and there little flakes of caseous matter. The base of the lung contained a good deal of air. It was this portion which had appeared nodular from the surface, and this appearance on section was found to be due to large nodules of dense pigmented tissue, containing little caseous foci. The left lung was adherent to the pericardium.

Microscopical Examination.

Emulsion of Cervical Glands.—No tubercle bacilli seen.

Pus from Left Bronchus.—Tubercle bacilli were numerous. They were long and beaded, but there were also a few short tubercle bacilli in addition.

CALF 1075. (Virus H 58. "F.G.")

Subcutaneous Inoculation of culture derived from human cervical glands through Guinea-Pig 1816.

Dose—80 milligrammes.

Date—May 2nd, 1906.

Weight at Inoculation—3 qrs. 20 lbs.

Killed—August 4th, 1906. [94 days after inoculation.]

Clinical Notes.

The calf was inoculated on May 2nd, 1906. It remained in good health, and grew rapidly; it was killed on August 4th, 1906, 94 days after inoculation.

Temperature.

The temperature was a little irregular during the fortnight following the injection; after this it remained perfectly normal until the animal's death.

Weights.

	cwts.	qrs.	lbs.
May 2nd, 1906 - - - -	0	3	20
August 4th, 1906 - - -	1	2	2

Total gain of weight—2 qrs. 10 lbs.

Rate of gain per week—5 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

At the Seat of Inoculation, on the right side of the neck, was a prominent fluctuating swelling measuring 3½ in. by 2½ in. by 2½ in., consisting of a fibrous walled cyst with liquefied caseous contents.

The Right Prescapular Gland was slightly enlarged, and contained a few groups of calcareous grains just under its capsule.

Prepectoral, Axillary, and Left Prescapular Glands.—Normal.

Pleura.—Normal.

Lungs.—Normal.

Thoracic Glands.—Normal.

Heart.—Normal.

Omentum and Peritoneum.—Normal.

Intestines.—Normal.

Mesenteric Glands.—Normal.

Spleen.—Normal.

Liver.—Normal.

Portal Glands.—Normal.

Kidneys.—Normal.

Suprarenals.—Normal.

Renal, Lumbar, and Iliac Glands.—Normal.

Tongue, Pharynx, Palate, Tonsils.—Normal.

Testes.—Normal.

Various Lymphatic Glands.

Precrural and Popliteal, Gluteal and Ischiatic, Pubic, Posterior-Pharyngeal and Hyoid, Submaxillary and Subparotid.—Normal.

CALF 985. (Virus H 58. "F.G.")

Subcutaneous Inoculation of culture derived from human lung through Guinea-Pig 1812.

Dose—50 milligrammes.

Date—March 23rd, 1906.

Weight at Inoculation—1 cwt. 3 qrs. 8 lbs.

Killed—June 27th, 1906. [96 days after inoculation.]

Clinical History.

The calf was inoculated on March 23rd, 1906. The development of the tumour at the seat of inoculation, and of the neighbouring prescapular gland, was similar to that usually seen in calves injected with a virus of Group II.

The calf remained in good health, and grew rapidly. It was killed on June 27th, 1906, 96 days after inoculation.

Temperature.

The temperature was somewhat irregular during the first few weeks, but from the beginning of May till the death of the animal it remained practically normal.

Weights.

	cwts.	qrs.	lbs.
March 23rd, 1906 - - -	1	3	8
June 27th, 1906 - - -	2	1	19

Total gain of weight—2 qrs. 11 lbs.

Rate of gain per week—4·8 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

At the Seat of Inoculation, on the right side of the neck, was a depressed scar over greatly thickened skin, beneath which was a calcareous patch about 1 in. in diameter, surrounded by dense fibrous tissue, and containing in its interior a little softened caseous matter.

The Right Prescapular Gland was slightly enlarged, and almost entirely composed of two large fibro-calcareous nodules, one of which measured 1½ in. and the other 1 in. in diameter. A portion of each of these nodules had already undergone softening.

The Prepectoral, Axillary, and Left Prescapular Glands were normal.

Pleura.—Normal.

Lungs.—On the surface of the right lung a single minute dark grey tubercle was seen. The organ was otherwise healthy.

Thoracic Glands.—Normal.

Heart.—Normal.

Tongue, Pharynx, Palate, Tonsils.—Normal.

Larynx and Trachœa.—Normal.

Intestines.—Normal.

Mesenteric Glands.—Normal.

Peritoneum.—Normal.

Spleen.—Normal.

Liver.—Normal.

Portal Glands.—Normal.

Kidneys.—Normal.

Suprarenals.—Normal.

Lumbar, Iliac, and Renal Lymphatic Glands.—Normal.

Testes.—Normal.

Various Lymphatic Glands.

Precrural and Popliteal.—Normal.

Gluteal and Ischiatic.—Normal.

Pubic.—Normal.

Posterior-Pharyngeal and Hyoid.—Normal.

Submaxillary and Subparotid.—Normal.

VIRUS H 59. "L.B."

(Post-mortem.)

MESENTERIC GLANDS.

CERVICAL GLANDS

LUNG.

BRAIN.

VIRUS H 59. "L.B."

CULTURE INOCULATIONS.

MESENTERIC GLANDS.

May 15, 1906

Strain derived from human mesenteric glands, through G.P. 1849.
Total duration of artificial cultivation : 2 months.
Culture used for inoculation : 4th, 21 days old, on pure bovine serum.



BULL-CALF 1063.
Subcutaneous.
Dose : 50 mg.
Died, June 12, 1906.
28 days.
General Tuberculosis, severe.

RABBITS.

895A	1 mg.	D. 34 days	G.T.
896A	0·1 mg.	D. 34 „	G.T.



COW-CALF 1077.
Subcutaneous.
Dose . 10 mg.
Died, June 15, 1906.
31 days.
General Tuberculosis, severe.

CERVICAL GLANDS.

April 7, 1906.

Strain derived from human cervical glands, direct.
Total duration of cultivation : 2 months.
Culture used for inoculation : 3rd 21 days old, on pure bovine serum.

RABBITS.

846	1 mg.	D. 18 days	G.T.
847	0·1 mg.	D. 69 „	„



BULL-CALF 1037.
Subcutaneous.
Dose : 10 mg.
Died, May 18, 1906.
41 days
General Tuberculosis, severe.

LUNG.

March 27, 1906.

Strain derived from human lung, direct.
Total duration of artificial cultivation : 7 weeks.
Subculture used for inoculation : 20 days old, on pure bovine serum.



BULL-CALF 965.
Subcutaneous.
Dose : 50 mg.
Killed when dying, May 28, 1906.
60 days.
General Tuberculosis, moderate.



BULL-CALF 987.
Subcutaneous.
Dose : 10 mg.
Killed when dying, May 15, 1906.
49 days.
General Tuberculosis, severe.



BULL-CALF 991.
Subcutaneous.
Dose : 10 mg.
Killed when well, June 29, 1906.
94 days.
Widespread, but retrogressive tuberculosis.
[Slight Tuberculosis].

RABBITS.

824	1 mg.	D. 22 days	G.T.
825	0·1 mg.	D. 70 „	G.T. Injection partly subcut.

BRAIN.

April 21, 1906.

Strain derived from human brain through G.P. 1860.
Total duration of artificial cultivation : two months.
Culture used for inoculation : 3rd., 21 days old, on pure bovine serum.



BULL-CALF 1057.
Subcutaneous.
Dose : 10 mg.
Died, May 22. 1906.
31 days.
General Tuberculosis, severe.

CHICK 9. [P] 10 mg. } K. 116 days. Normal throughout.
CHICK 10. [P] 10 mg. }

RABBITS.

858	1 mg.	D. 23 days.	G.T.
859	0·1 mg.	D. 48 „	G.T.

VIRUS H 59. 'L.B."

CULTURE INOCULATIONS *continued.*

BRAIN.

August 16th, 1906.

Strain derived from human brain, through Guinea-Pig 1869.

Total duration of artificial cultivation. 5 months.

3rd subculture on pure serum used, 21 days old.

PIG 65.

Subcutaneous.

Dose: 50 mg.

Killed when dying, September 15th, 1906.

30 days.

P.M.—Acute general tuberculosis.

PIG 59.

Subcutaneous.

Dose: 10 mg.

Died, October 25th, 1906.

70 days.

P.M.—Severe and widespread general tuberculosis.

PIG 67.

Subcutaneous.

Dose: 1 mg.

Killed in apparent good health, November 8th, 1906.

84 days.

P.M.—General tuberculosis very severe in spleen.

PIG 73.

Subcutaneous.

Dose: 0·1 mg.

Killed when well, November 10th, 1906.

86 days.

P.M.—General tuberculosis, severe in spleen.

PIG 63

Fed.

Dose: 10 mg.

Killed when well, November 12th, 1906.

88 days.

P.M.—General tuberculosis. (Tonsils ulcerated. Peyer's patches showed healed ulcers and scattered yellow tubercles. Glands of the alimentary tract enlarged and extensively caseated.)

PIG 71.

Fed.

Dose: 1 mg.

Killed when well, November 13th, 1906.

89 days.

P.M.—General tuberculosis, not severe. (Intestines normal. Glands of the alimentary tract severely affected, many being caseous throughout. Moderate number of discrete caseous tubercles in lungs, liver, and spleen.)

PIG 57.

Fed.

Dose: 0·1 mg.

Killed when well, November 14th, 1906.

90 days

P.M.—General tuberculosis, not severe. (Lesions as in Pig 71, except that the glands of the throat were only slightly affected.)

CHIMPANZEE 5.

Subcutaneous.

Dose: 1 mg.

Died, November 3rd, 1906.

79 days.

P.M.—General tuberculosis, very severe in intestine and intestinal lymphatic glands.

DOG 17.

Intraperitoneal.

Dose: 10 mg.

Died, September 22nd, 1906.

37 days.

P.M.—Intense tuberculous peritonitis; general tuberculosis; miliary tubercles in lungs and liver.

RABBITS [FED].

937	10 mg.	Killed, 51 days	General tuberculosis.	
938	10 „	Died, 74 „	„	
939	1 „	„ 37 „	Tuberculosis of intestines, mesenteric glands, lung, and a bronchial gland. Death due to biliary cirrhosis	
940	1	Killed, 90 „	Tuberculosis of alimentary tract, glands in connection with it, lungs, kidneys, and omentum.	

GUINEA-PIGS [FED].

1947	1 mg.	Killed, 51 days	Slight general tuberculosis.	
1948	1 „	„ 61 „	„ „ „	
1949	1 „	„ 91 „	General tuberculosis.	
1950	0·1 „	„ 51 „	„ „	
1951	0·1 „	„ 61 „	Slight general tuberculosis.	
1952	0·1 „	„ 91 „	General tuberculosis.	

Virus H 59. "L.B."

L.B., A MALE CHILD, AGED TWO AND THREE QUARTER YEARS, ADMITTED TO HOSPITAL ON JANUARY 25TH, 1906, SUFFERING FROM GENERAL TUBERCULOSIS. DIED FEBRUARY 1ST, 1906.

Family History.—Mother suffers from cough. No history of tubercle on father's side.

Clinical History.—The patient had never been a strong child. He had suffered from measles in June, 1905. During the twelve months before admission he had been under medical treatment for wasting, swollen abdomen, diarrhœa and vomiting.

On admission the child was obviously ill, and was thin and anæmic in appearance. The hands and feet were cyanosed. Enlarged lymphatic glands could be detected in the neck. The temperature was 102°. The lungs on examination showed signs of extensive disease.

Two days after admittance, the child developed pneumo-thorax on the left side, and died four days later.

POST-MORTEM EXAMINATION.

Thorax.

Lungs.—Showed extensive tuberculous infiltration with emphysema and small cavities.

Bronchial Glands.—Appeared to be slightly enlarged.

Abdomen.

Peritoneum.—Was healthy.

Intestines.—Showed numerous small tuberculous ulcers.

Mesenteric Glands.—Were enlarged and caseating.

Liver and Spleen.—Normal.

Kidneys.—Some small grey tubercles were seen under the capsules of both kidneys.

Meninges of Brain.—Showed no evidence of tuberculous disease. Some very small abscesses were seen on surface of the brain.

Bones and Joints.—Were all healthy.

DESCRIPTION OF MATERIAL SENT TO BLYTHWOOD.

Mesenteric Glands.—Three large mesenteric glands, the largest measuring $\frac{3}{4}$ in. by $\frac{1}{2}$ in., were grouped together. Two of them were found on section to consist entirely of caseous matter; the third was fibro-caseous. Beside these three glands, numerous others, ranging in size from a shot to a small pea, were received, and in several of them yellow fibro-caseous tubercles, or small caseous foci, were found.

Cervical Glands.—Three cervical glands were received. The biggest was the size of a large bean, and contained a number of yellow foci.

Brain.—The small portion of the cerebellum examined contained a pea-sized yellow nodule, composed of soft caseating matter.

Lung.—The small portion of lung received was found on section to be closely packed with yellowish tubercles, occasionally separate, but mostly confluent, forming irregular caseating areas. No cavities could be found in the small specimen received.

Spleen.—Showed no evidence of tuberculous disease.

Liver.—Apparently normal.

Microscopical Examination.

Scraping from Mesenteric Gland.—Tubercle bacilli.

Scraping from Cervical Gland.—No tubercle bacilli to be found.

Scraping from Lung.—Showed numerous tubercle bacilli.

Caseo-Pus from Cerebellum.—No tubercle bacilli.

Separate emulsions, made from mesenteric glands, lung and brain, all showed tubercle bacilli, but none could be found in emulsions made from cervical glands, liver or kidney.

CALF 1063. (Virus H 59. "L.B.")

Subcutaneous Inoculation of culture derived from human mesenteric glands through Guinea-Pig 1849.

Dose—50 milligrammes.

Date—May 15th, 1906.

Weight at Inoculation—2 qrs. 16 lbs.

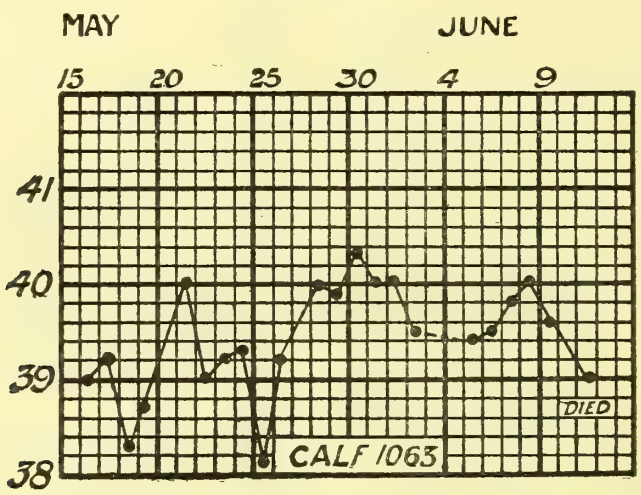
Died—June 12th, 1906. [28 days after inoculation.]

Clinical Notes.

The calf was inoculated on May 15th, 1906. It was suffering from diarrhœa previous to inoculation, and did not grow normally (no other animal was available on the day of inoculation).

A small solid tumour developed at the seat of inoculation and the nearest glands became enlarged. The animal soon showed signs of illness, and the respiration became accelerated. The calf died on June 12th, after a short illness lasting 28 days.

Temperature.



Weights.

	qrs.	lbs.	
May 15th, 1906 - - - - -	2	16	Inoculated.
June 12th, 1906 - - - - -	2	8	Killed.

Total loss of weight during experiment.—8 lbs.

Average rate of loss per week.—2 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Thin.

At the Seat of Inoculation, on the right side of the neck, was a small solid fibro-caseous tumour which measured 3¼ in. by 3 in. by 1 in., and weighed 6 ozs. It infiltrated skin and subjacent muscle.

The Right Prescapular Gland measured 2¾ in. by 1¼ in. by ¾ in., and weighed 2 ozs. It was solid and caseous throughout.

The Right Prepectoral, the size of a cherry, was similar in structure.

The Axillary and Left Prescapular Glands contained numerous small caseating foci.

The Pleura was normal.

The Lungs were very darkly congested, and more than half, particularly the anterior parts, were solid. They were very thickly peppered with minute tubercles, which appeared whitish on the dark purple portions, and reddish grey with a minute pale centre in the air-containing portions. Section showed similar tubercles thickly scattered throughout the organ.

The Thoracic Glands were only very slightly enlarged. They were firm and dark in colour, and contained many minute points in an early stage of caseation.

Heart.—A few little tubercles were seen in the intima of the right auricle.

Tongue.—There were little tuberculous foci at the sides of the root of the tongue, especially on the left.

The corrugated mucous membrane on the posterior wall of the naso-pharynx, and the mucous membrane on the nasal surface of the soft palate, contained very numerous minute caseating foci.

The œsophagus showed small tubercles widely scattered over the mucous membrane.

There were many small tubercles on the mucous membrane of the trachea.

The Thyroid.—Was normal.

Intestines.—The Peyers' patches of the small intestine showed many minute caseating points, particularly numerous towards the end of the ileum.

There were many little foci also in the large intestine.

The Mesenteric Glands.—Contained numerous small caseating foci.

Peritoneum.—The omentum contained numerous little tubercles surmounted by hypertrophied villous tufts.

The Spleen.—Showed no definite tubercles, but the malphigian bodies appeared denser and greyer than normal, and were probably affected with tuberculosis.

The Liver.—Was peppered extremely thickly with minute, pale grey tubercles which just rise above the surface, and section showed them almost as thickly scattered throughout the organ.

The Portal Glands—Pale in colour, were firmer than normal. They were packed with very minute early caseating foci.

The Kidneys.—Were peppered rather thickly on the surface with small, indefinite, pale tubercles, and these could be seen on section scattered throughout the cortex.

Suprarenals.—There were numerous little tubercles scattered throughout the cortex of both suprarenals.

The Renal, Lumbar, and Iliac Glands.—Contained numerous small caseating foci.

Eyes.—There were two or three little tubercles in the ciliary processes of each eye.

The Testes.—Were apparently normal.

Various Lymphatic Glands.

Precrural and Popliteal, Gluteal and Ischiatic, Pubic, Posterior-Pharyngeal and Submaxillary, Hyoid and Subparotid.—All contained numerous small caseating foci.

Microscopical Examination.

Tubercle from Tongue.—Tubercle bacilli.

Tubercle from Oesophagus.—Tubercle bacilli.

Scraping from Spleen.—Tubercle bacilli.

CALF 1077. (Virus H 53. "L.B.")

Subcutaneous Inoculation of culture derived from human mesenteric glands through Guinea-Pig 1849.

Dose—10 milligrammes.

Date—May 15th, 1906.

Weight at Inoculation—3 qrs. 12 lbs.

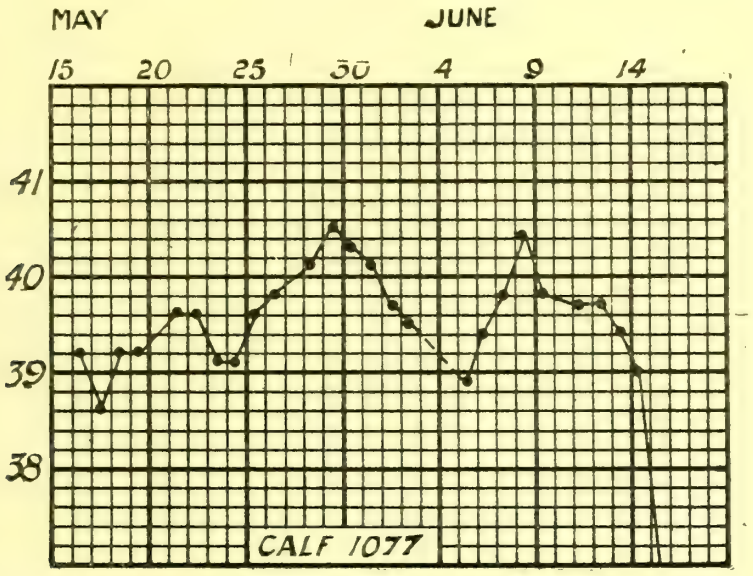
Died—June 15th, 1906 [31 days after inoculation.]

Clinical Notes.

The calf was inoculated on May 15th, 1906.

A solid fixed tumour developed at the seat of inoculation, and the nearest glands became enlarged. The temperature quickly rose, reaching 40·5° C. on the 13th day. The animal soon showed signs of illness and the respiration became accelerated. The disease followed the usual course, and the calf died on June 15th, 31 days after inoculation.

Temperature.



Weights.

	qrs.	lbs.	
May 15th, 1906 - - - -	3	12	Inoculated.
June 15th, 1906 - - - -	2	25	Killed.

Total loss of weight during experiment.—15 lbs.

Average rate of loss per week.—3·4 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

At the seat of Inoculation.—On the right side of the neck, was a small solid tumour which measured 4½ in. by 2¾ in. by ¾ in., and weighed 5 oz. It was composed of fibro-necrotic tissue, and infiltrated skin and subjacent muscle.

The Right Prescapular Gland.—Was much enlarged, measuring 4 by 2 by 1¼ in., and weighing 4 oz. It was chiefly composed of fibro-necrotic tissue, partly also of firm, translucent tissue infiltrated with caseating points.

The Right Prepectoral Gland.—About ¾ in. in diameter, was similar in structure.

The Left Prescapular and Axillary Glands.—Each contained a number of small tubercles.

Two Enlarged Deep Cervical Glands.—Were caseo-necrotic throughout.

Pleura.—Normal.

The Lungs.—Were dark red in colour and, to a very large extent, airless. Their surfaces were thickly studded with little grey tubercles, and similar tubercles were thickly scattered throughout the whole organ. They were all very small, and none of them showed any sign of caseation.

The Thoracic Glands.—Were greatly enlarged. They were firm and elastic, much softer than the prescapular, and their cortices were thickly infiltrated with a caseous network.

The Peribronchial Glands.—Were much enlarged, ¾ in. in diameter. They resembled the other thoracic glands, but caseation was not so advanced.

Heart.—In the endocardium of the right auricle was a little grey tubercle. A single tubercle was seen in the right ventricle. Left side of heart was normal.

The Tongue and Mouth.—Were normal.

Several tubercles were seen in the *pharyngeal mucous membrane*, one distinctly caseating.

One or two early easeating tubercles were seen in each *tonsil*.

There were several very small tubercles in the mucous membrane of the upper part of the trachœa.

Oesophagus and Larynx.—Normal.

Intestines.—A few minute solid yellow points were seen in the Peyer's patches of the small intestine. These were undoubtedly tubercles.

A few similar foci were seen in the large intestine.

The Mesenteric Glands.—Contained numerous small early caseating tubercles.

The Peritoneum.—Showed a considerable number of small tubercles loosely attached to it.

Spleen.—A moderate number of small grey tubercles were seen in the spleen. These were very inconspicuous owing to their small size, and were most obvious about the thick end. The organ was not enlaged.

Liver.—The surface of the liver was rather thickly peppered with little grey tubercles. A few of these, more superficial than the rest, were nearly ⅛ in. in diameter. The rest were quite small, and were, for the most part more deeply seated. Section showed them scattered throughout the organ.

The Portal Glands.—Were swollen, and their cortices were packed with early tubercles.

Kidneys.—A moderate number of very small and rather ill-defined grey tubercles were seen on the surface of each kidney. A few also were seen on section in the cortex.

Suprarenals.—Normal.

Renal, Lumbar, and Iliac Glands.—Contained numerous small tubercles.

Mammary Gland.—Normal.

Various Lymphatic Glands.

Precrural and Popliteal, Gluteal and Ischiatic, Supramammary, Posterior-Pharyngeal and Hyoid, Submaxillary and Subparotid.—Every gland contained tubercles in an early stage of caseation.

CALF 1037. (Virus H 59. "L.B.")

Subcutaneous Inoculation of culture derived from human cervical glands.

Dose—10 milligrammes.

Date—April 7th, 1906.

Weight at Inoculation—1 cwt. 0 qr. 23 lbs.

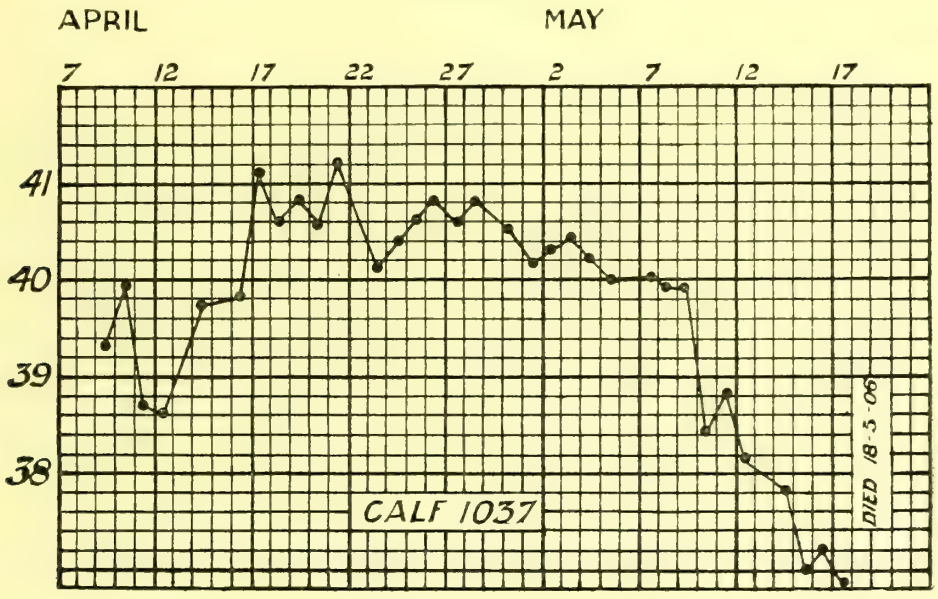
Died—May 18th, 1906. [41 days after inoculation.]

Clinical Notes.

The calf was inoculated on April 7th, 1906. A solid fixed tumour developed at the seat of inoculation, which afterwards sloughed. The nearest lymphatic glands became enlarged. The temperature rose to 41·1° C. on the 10th day, and remained high.

At the end of the third week the respiration was noticed to be accelerated, and the animal was ill. It rapidly grew worse, the difficulty of respiration increased, and the animal died on May 18th, 41 days after inoculation.

Temperature.



Weights.

	cwts.	qrs.	lbs.	
April 7th, 1906 - - -	1	0	23	Inoculated.
May 18th, 1906 - - -	1	0	1	Died.

Total loss of weight during experiment—22 lbs.

Average rate of loss per week—3·7 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Very thin.

At the Seat of Inoculation.—On the right side of the neck was a prominent solid tumour with a central superficial ulcer about 2½ in. in longest diameter. The ulcer was blackened and dry. The tumour itself measured 6¾ in. by 5 in. by 3 in., and weighed 1 lb. 8 ozs. It was composed of fibro-necrotic tissue, and infiltrated skin and subjacent muscle.

The Right Prescapular Gland.—Was much enlarged, weighed 8 ozs., and measured 4¾ in. by 2½ in. by 2¼ in. It was almost entirely composed of caseous tissue.

The Prepectoral Gland.—About ⅝ in. in diameter, was similar in structure.

The Pectoral Glands.—Were also affected, but were not in such an advanced stage.

Left Prescapular and Axillary Glands.—Contained one or more caseous tubercles of rather large size.

Pleura.—Many small flattened tubercles were seen on the costal pleura along the margin of the ribs, and on the pleural surface of the diaphragm.

Lungs.—The lungs were large. The anterior parts were solid and deeply congested. They weighed 5 lbs. 2 ozs. Their surfaces were thickly studded with tubercles of various sizes up to ⅛ in. or ⅙ in., and with groups of tubercles up to ¼ in. The anterior parts were dark reddish purple in colour; the posterior parts a light red, and the tubercles were surrounded by a narrow purple zone. Section showed numerous small tubercles, irregular in outline, scattered thickly throughout the lung substance, which showed numerous small dark purple consolidated areas posteriorly, and was completely consolidated anteriorly.

The Thoracic Glands.—Were much enlarged, and together weighed 6 ozs. They were composed of firm elastic grey tissue infiltrated with caseous striæ. There was a considerable amount of œdema around them.

Heart.—Two or three little translucent tubercles were seen projecting from the endocardium of the right auricle, and there was a larger tubercle in the myocardium just beneath it.

Peritoneum.—There were a few small tubercles on the omentum.

Intestines.—All the small Peyer's patches of the small intestine contained numerous yellow foci; the continuous patch in the ileum showed similar tubercles along its entire length.

The large intestine was normal.

The Mesenteric Glands.—Contained a few tubercles.

Spleen.—The spleen was large, and weighed 12 ozs. It was chiefly composed of very large firm reddish tubercles with caseating centres.

Liver.—On the surface of the liver a fairly large number of rather large tubercles were seen. A few of these were superficial about ⅛ in. in diameter, and the others, which were more deeply seated, were many of them surrounded by a broad zone of liver tissue which was paler than the rest. On section tubercles were seen rather thickly scattered throughout the liver substance, but no pale zones were seen as on the surface.

The Hepatic Glands.—Were enlarged, grey, and firm and their cortices were full of tubercles.

Kidneys.—In the cortex of each kidney were several tubercles of rather large size.

Suprarenals (left and right).—No tubercles were seen in either.

The Renal, Lumbar, and Iliac Glands.—Each contained one or more caseous tubercles of rather large size.

The Tongue.—Was normal.

There were a few tubercles seen on the mucous membrane of the naso-pharynx and in each *Tonsil.*

There was a tubercle in the *Larynx,* and a little group of tubercles just posterior in the anterior part of the *Trachea.*

Eyes.—There was a suspicious focus on one of the ciliary processes of the right eye. (No tubercle bacilli seen in it.)

Testes.—Normal.

Various Lymphatic Glands.

One or more caseous tubercles of rather large size were seen in each of the following glands :—

Precrural, Popliteal, Gluteal, Ischiatic, Pubic, Post-Pharyngeal, Submaxillary, Hyoid, and Subparotid.

Microscopic Examination.

Suspicious Focus from Right Eye.—No tubercle bacilli seen.

CALF 965. (Virus H 59. "L.B.")

Subcutaneous Inoculation of culture derived from human lung.

Dose—50 milligrammes.

Date—March 27th, 1906.

Weight at Inoculation—2 cwts. 0 qr. 10 lbs.

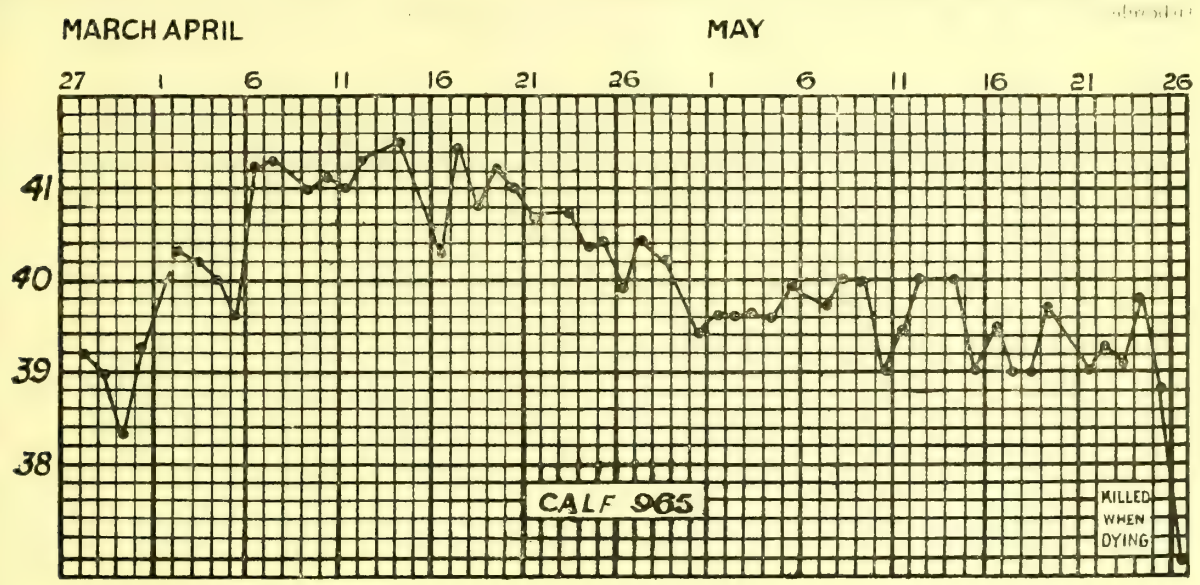
Killed when dying—May 26th, 1906. [60 days after inoculation.]

Clinical Notes.

The calf was inoculated on March 27th, 1906. About the middle of April the calf began to look ill and thin, but the respiration was then but little affected. On May 7th it was found lying with its head resting on the ground, and appeared to be dying, but the temperature showed no lethal fall. The animal by this time was extremely emaciated, but it continued to take food fairly well, and its respiration was never much affected.

In the following week there was a slight improvement, after which the animal's condition showed no definite change for ten days. On May 24th it was found to be prostrate; on 25th it was obviously sinking. A definite lethal fall of temperature to 39·6° C. having occurred on May 26th, the animal was killed (60 days after inoculation).

Temperature.



Weights.

The loss of weight during the experiment was very considerable.

	cwts.	qrs.	lbs.
March 27th, 1906 - - -	2	0	10
May 26th, 1906 - - -	1	1	24

Total loss of weight.—2 qrs. 14 lbs.

Average rate of loss per week.—8·2 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Very emaciated.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a large solid tumour, which measured 6¾ in. by 4½ in. by 2½ in., and weighed 1 lb. 9 ozs. It consisted of the usual tough whitish fibrous mass, with an irregular honey-combed cavity in the middle, containing clear serum, and a considerable mass of muscle infiltrated with caseous tubercles beneath it. The skin over the tumour was black and dry, and already there was a line of ulceration where it was commencing to separate from the living skin around.

Right Prescapular Gland.—Was enormously enlarged. It measured 6¼ in. by 3½ in. by 2¼ in., and weighed 1 lb. 3 ozs. It was very hard and caseo-necrotic throughout.

Left Prescapular Gland.—Contained several large tubercles.

Two Prepectoral Glands.—Each one and a quarter inches in diameter, were similar in structure to the right prescapular.

Axillary Glands.—Were œdematous, but free from tubercle.

Thorax.

Pleura.—There were numerous fibrous tubercles on the pleura, and the right lung was adherent to the sixth rib.

Lungs.—The lungs were large, and weighed 7 ozs. The two anterior lobes on the right side were carnified, the bronchi being greatly dilated and distended with thick pus. (No tubercle bacilli were found in this pus, and the condition of this part of the lung had probably little or nothing to do with the injection.) The anterior parts of the posterior lobes on each side were also carnified, but the bronchi were not so much distended.

The rest of the lung was somewhat sparsely studded with tuberculous nodules about ⅛ in. in diameter. Section showed little opaque grey tubercles scattered throughout the lung substance. These were surrounded by a dark red zone, and frequently a little group of tubercles was embedded in a patch of consolidated lung tissue. Part of each posterior lobe, lying just behind the carnified region, was entirely consolidated in consequence of the confluence of such patches.

Trachea.—There was a small ulcer in the anterior part of the trachea.

Thoracic Glands.—The thoracic glands were enlarged, and together weighed 6 ozs. On section they were grey and translucent, and studded with caseous foci.

Abdomen.

Peritoneum, Omentum.—There were several rather large tubercles on the omentum.

Stomach.—Normal.

Intestines.—Two little tuberculous patches were seen in the small intestine. The large intestine was normal.

Mesenteric Glands.—Three tubercles only were found in these glands.

Spleen.—Was somewhat thickened, and was packed with large tubercles, some of them about ¼ in. in diameter.

Liver.—The surface of the liver showed a moderately large number of groups of tubercles, the larger of which, ¼ in. or more in diameter, consisted of innumerable little irregular foci, more or less confluent towards the centre of the patch. In addition to these there were many small single tubercles, and a few large ones raised above the surface, with overhanging margins. Section showed tubercles of various sizes scattered moderately thickly throughout the organ.

Portal Glands.—Were enlarged and resembled the thoracic.

Kidneys.—The right kidney showed a considerable number of small tubercles in the cortex, and a tuberculous nodule about ¼ in. by ⅓ in. In the left kidney there were only a few superficial tubercles.

Suprarenals.—There were one or two tubercles in the cortex of each suprarenal.

Renal Gland.—Was packed with tubercles.

Lumbar Glands, Iliac Glands.—Contained several large tubercles.

Genito-Urinary System.

Testes.—Normal

Special Glands.

Precrural, Pubic.—Contained several large tubercles.

Gluteal.—Each gluteal gland contained a tubercle.

Ischiatic.—The right ischiatic was normal; the left was not seen.

Popliteal.—The right popliteal gland was normal; the left contained a single tubercle.

Submaxillary.—Contained several tubercles.

Subparotid.—Were normal.

Posterior Pharyngeal.—Each contained several tubercles.

Hyoid.—The right hyoid was normal; the left contained a tubercle.

Tongue, Palate, Tonsils, Pharynx.—Normal.

Microscopical Examination.

Pus from Carnified Lung.—No tubercle bacilli. Numerous other bacilli.

CALF 987. (Virus H 59. "L.B.")

Subcutaneous Inoculation of culture derived from human lung.

Dose—10 milligrammes.

Date—March 27th, 1906.

Weight at Inoculation—2 cwts. 0 qr. 5 lbs.

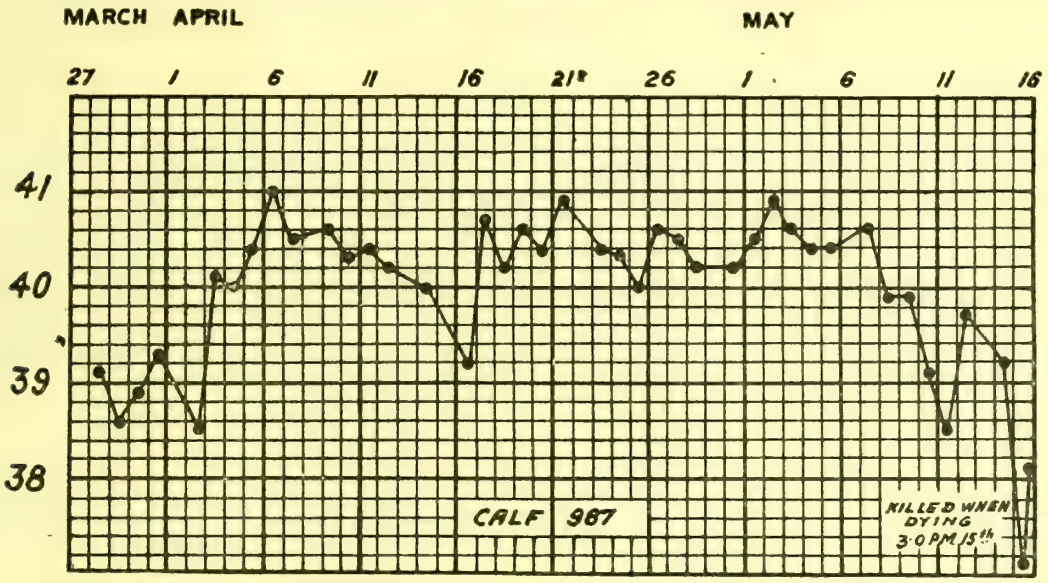
Killed—May 15th, 1906. (49 days after inoculation.)

Clinical Notes.

The calf was inoculated on March 27th, 1906. A very large tumour developed at the seat of inoculation, and the prescapular gland became greatly enlarged.

Four weeks after inoculation the former measured 9 in. by 6 in., and the latter 7½ in. by 4 in. Up to this time the calf had remained well; a few days later its respiration was increased in frequency, and it stood with arched back, being obviously ill. About 14 days after, on May 15th, it was found to be dying, and was therefore killed, 49 days after inoculation.

Temperature.



Weights.

The calf lost over a quarter of its original weight during the experiment.

	cwts.	qrs.	lbs.
March 27th, 1906 - - - -	2	0	5
May 15th, 1906 - - - -	1	2	3

Total loss of weight.—2 qrs. 2 lbs.

Average rate of loss per week.—8·3 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Thin.

At the Seat of Inoculation.—Was a very large tumour measuring 8 in. by 6½ in. and 3½ in. in thickness, and weighing 3 lbs. 12 ozs., composed of the usual dense yellowish white fibrous tissue. The skin was much thickened, and so infiltrated that in parts no clear distinction could be seen between it and the fibrous tissue below. The muscle beneath was thickly infiltrated with dense caseating nodules for a thickness of nearly two inches.

The Right Prescapular Gland.—Was very greatly enlarged, and weighed 10 ozs. It measured 4½ in. by 2¾ in by 2½ in. It was firm and composed of yellowish or salmon-pink caseo-necrotic tissue.

The Right Prepectoral Gland, the size of a bantam's egg, was similar.

There was much œdema around these glands, and below the tumour.

The Right Pectoral Gland, lying over the first rib, was much enlarged, measuring nearly 1½ in. in length. It was a good deal softer than the glands above mentioned, and was thickly studded with caseating foci.

Five deep Cervical Glands, each as large as a blackbird's egg or larger, resembled the pectoral.

The Left Prescapular Gland was large and œdematous, and part of its cortex was undergoing early tuberculous change into firm translucent grey tissue infiltrated with caseating points.

The Right Axillary Gland was very large. It was oedematous, and very much resembled the left prescapular.

The Left Axillary.—Contained one or two caseating tubercles.

Pleura.—There were numerous early flattened grey tubercles on the pleura, following the lines of the ribs, and some rather large tubercles on the pleural surface of the diaphragm.

The Lungs were very large, and weighed 9 lbs. 2 ozs. The anterior parts were mottled with patches of consolidation. The surface was studded fairly thickly with large tubercles and groups of tubercles, the former for the most part being about ⅛ in. in diameter and distinctly raised, the latter not infrequently as much as ¼ in., and having overhanging margins.

Section showed rather large tubercles scattered moderately thickly throughout the organ, and also a rather large number of angular consolidated areas, dark reddish grey and packed with small grey tubercles. These were of any size up to ¼ in. or even ½ in.

The Bronchial and other Thoracic Glands were greatly enlarged, and together weighed 10 oz. They were composed of the usual firm grey tissue, and infiltrated with caseating points.

The Heart was normal, except for some irregular patches in the intima which resembled atheroma.

Omentum and Peritoneum.—There were a few tubercles on the omentum.

Intestines.—Four small tubercles were seen in solitary follicles of the small intestine. The large intestine was normal.

Mesenteric Glands.—In the mesenteric glands, which were not enlarged, two tubercles were found.

The Cœliac Glands contained numerous tubercles and tuberculous nodules.

Spleen.—The spleen was fairly thickly packed with yellow tubercles of the size of ordinary shot.

Liver.—The liver was studded with many large raised tubercles with overhanging margins, measuring some of them nearly $\frac{1}{4}$ in. in diameter. Many of the smaller tubercles also could be seen through the capsule. Section showed rather numerous tubercles scattered throughout, few of which were as much as $\frac{1}{8}$ in. in diameter.

The Hepatic Glands.—Were enlarged and packed with caseating tubercles.

Kidneys.—The kidneys contained a moderate number of rather large tubercles in their cortex, twenty being counted on the surface of one of them.

Suprarenals.—One tubercle was found in the right, the left was normal.

The Renal and Lumbar Glands were packed with tubercles. The *Iliac* contained a few caseating tubercles.

Tongue.—There was a slight abrasion on the right-hand side of the tongue which may have been tuberculous.

Tonsils, Pharynx, Larynx, and Trachea.—Normal.

Testes.—Normal.

Eyes.—Normal.

Joints.—Several were examined. No tuberculosis.

Various Lymphatic Glands.

The Precrural, Popliteal, Gluteal, and *Pubic Glands* contained one or more caseating tubercles.

The Left Ischiatic Gland was normal. The right was not seen.

The Submaxillary, Hyoid, Subparotid, and *Right Post pharyngeal Glands* contained a few caseating tubercles. None were seen in the left post-pharyngeal.

[CALF 991. (Virus H 59. "L.B.")

Subcutaneous Inoculation of culture derived from human lung.

Dose—10 milligrammes.

Date—March 27th, 1906.

Weight at Inoculation—1 cwt. 3 qrs. 18 lbs.

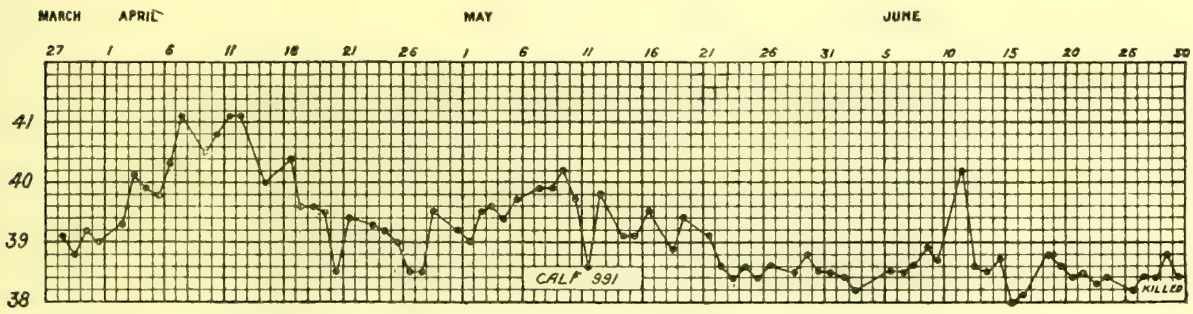
Killed—June 29th, 1906. (94 days after inoculation.)

Clinical Notes.

The calf was inoculated on March 27th, 1906. About 3 weeks later it was noticed to be unwell, and it had some cough. The tumour at the seat of inoculation was then very large (7½ in. by 6 in.), as was the prescapular gland (7 in. long).

A few days later the calf had quite recovered, and it remained well for two months. On June 29th it was killed, 94 days after inoculation.

Temperature.



Weights.

The rate of gain of weight per week was about half that which might have been expected in the case of a healthy calf of the same age.

	cwts.	qrs.	lbs.
March 27th, 1906 - - -	1	3	18
June 29th, 1906 - - - -	2	1	1

Total gain of weight during experiment.—1 qr. 11 lbs.

Average rate of gain per week.—2·9 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

At the Seat of Inoculation, on the right side of the neck, was a flat fluctuating swelling, which measured 5¼ in by 3¾ in. by 2¼ in. and weighed 1 lb. It was composed of dense salmon-pink fibro-necrotic tissue, surrounded by a dense white capsule.

On the superficial aspect of the necrotic mass, between it and the greatly thickened skin, was a cavity containing serous fluid with a few caseous flakes. There were a few tubercles in the subjacent muscle.

The Right Prescapular Gland.—Measured 3 in. by 1½ in. by 1¼ in., and weighed 2 ozs. It was dense, caseo-necrotic, slightly calcareous, and surrounded by a dense white capsule.

The Right Prepectoral Gland.—The size of a large pea, contained a small fibro-calcareous nodule.

The Left Prescapular Gland.—Contained one or two tubercles; the *Axillary Glands* were normal.

Pleura.—Along the margins of the ribs the villous tufts were hypertrophied, and in places formed flattened plaques of pink fibrous tissue.

Lungs.—The villous tufts on the surface of the lungs were also hypertrophied, and here and there contained tubercles.

Scattered thickly all over the surface of each lung were little translucent grey tubercles, often confluent with one another, so as to form little irregular patches; the centres of the larger of these were calcareous.

Section showed innumerable tuberculous foci of this kind scattered throughout the organ. The lung tissue in between, however, looked perfectly healthy.

The Thoracic Glands.—Were enlarged, and packed with calcareous granules.

Heart.—Normal.

Tongue, Pharynx, Tonsils.—Normal.

On the buccal surface of the Palate was a little tubercle in the mucous membrane.

Intestines.—Normal.

The Mesenteric Glands.—Were large, and many of them contained tuberculous nodules. Many of these were the size of peas, and were fibrous with caseo-calcareous centres.

Peritoneum.—Normal.

Liver.—Normal.

The Portal Glands.—Contained a few calcareous foci.

Spleen.—In the spleen about half a dozen little tubercles were found.

Kidneys.—Normal.

Suprarenals.—Normal.

Renal Glands.—Contained one or two tubercles.

Lumbar and Iliac Glands.—Normal.

Testes.—Normal.

Various Lymphatic Glands.

Both Popliteal and the Left Precrural Glands contained one or more tubercles.

Right Precrural, Gluteal, Ischiatic and Pubic Glands.—Normal.

Posterior-Pharyngeal, Hyoid, Submaxillary and Subparotid Glands.—Each contained one or more calcareous tubercles; some of them were of rather large size.

CALF 1057. (Virus H 59. "L.B.")

Subcutaneous Inoculation of culture derived from brain through Guinea-Pig 1860.

Dose—10 milligrammes.

Date—April 21st, 1906.

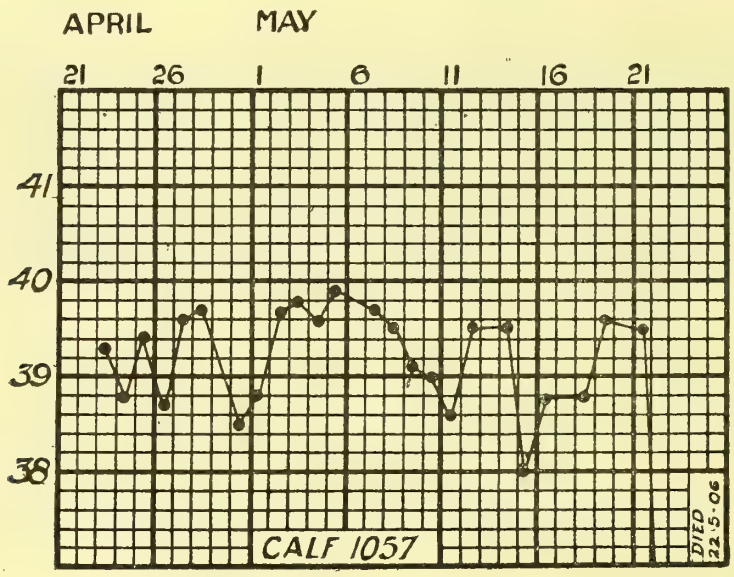
Weight at Inoculation—1 cwt. 0 qr. 5 lbs.

Died—May 22nd, 1906. (31 days after inoculation.)

Clinical Notes.

The calf was inoculated on April 21st, 1906. A small solid tumour developed at the seat of inoculation, and the nearest lymphatic glands became enlarged. The animal soon became ill and thin, and the respiration accelerated. It gradually grew worse, and died on May 22nd, 31 days after inoculation.

Temperature.



Weights.

The calf lost weight rapidly during the experiment.

	cwts.	qrs.	lbs.	
April 21st, 1906 - - - -	1	0	5	Inoculated.
May 22nd, 1906 - - - -	0	3	12	Died.

Total loss of weight during experiment.—21 lbs.

Average rate of loss per week.—4·7 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General condition.—Very thin.

At the Seat of Inoculation on the right side of the neck, was a small tumour measuring $3\frac{3}{4}$ in. by $2\frac{5}{8}$ in. by $1\frac{1}{2}$ in., and weighing 6 ozs. It was dense, fibro-necrotic, and contained a small central cavity full of serum. It infiltrated skin and subjacent muscle.

The Right Prescapular Gland measured $3\frac{1}{4}$ in. by $1\frac{1}{2}$in. by $1\frac{1}{4}$ in. and weighed 3 ozs. It was caseo-necrotic throughout.

The Prepectoral Gland, 1 in. in diameter, was similar in structure.

The Axillary and Left Prescapular Glands were swollen, and packed with caseous tubercles.

Thorax.

Pleura.—There were one or two small tubercles on the pleura.

The Lungs were thickly peppered with small opaque grey tubercles about 1 millimetre in diameter. They were each of them surrounded by a narrow and very sharply defined dark red angular zone which frequently was confluent with that of neighbouring tubercles. In this way irregular areas of consolidation were formed, especially in the left lung, so that this was largely consolidated throughout. The little tubercles were thickly scattered everywhere throughout the lung substance.

The Thoracic Glands were enlarged and together weighed $2\frac{1}{2}$ ozs. They were composed of pinkish grey tissue, closely infiltrated with a network of more or less confluent irregular caseous spots.

The Heart was normal.

The Tongue was normal.

There were a few small caseous tubercles in the naso-pharynx, and numerous tubercles in each *Tonsil.*

There were numerous small tubercles in the mucous membrane of the anterior part of the *Trachea.*

The Thymus Gland contained fairly numerous caseous tubercles just beneath the capsule. (This is the first time that tuberculosis of the thymus has been seen here in the calf.)

The Thyroid and Salivary Glands were normal.

Abdomen.

Intestines.—Little caseating tubercles were scattered throughout the small intestine, especially in the Peyer's patches. In the last two yards of the ileum they were extraordinarily numerous, there being many little tubercles in every square inch.

The large intestine, especially the cæcum, also contained numerous early tubercles.

The Mesenteric Glands were all of them swollen, and their cortices infiltrated with a caseating network.

Peritoneum.—On the omentum were a good many tubercles, some of them $\frac{1}{8}$ in. in diameter, loosely attached.

The Spleen was slightly swollen, and was thickly packed with tubercles of various sizes, all small.

Liver.—The surface of the liver was thickly peppered with little tubercles, none larger than one or two millimetres in diameter, and many, more deeply seated, much smaller. Section showed the little tubercles to be scattered throughout the whole of the liver substance.

The Portal Glands were much enlarged, and were thickly infiltrated with a caseous network like that of the thoracic glands.

The Kidneys showed a moderate number of very small grey tubercles just beneath the capsule. On section they were seen scattered throughout the cortex, but very sparsely.

Suprarenals.—Each contained a few small tubercles.

Renal, Lumbar, and Iliac Glands.—All were swollen, and packed with caseous tubercles.

Pancreas.—Normal.

Testes.—There was a single tubercle in the right testis. The left was normal.

Eyes.—Normal.

Various Lymphatic Glands.

The following lymphatic glands were all swollen and packed with caseating tubercles:—*Precrural and Popliteal, Gluteal and Ischiatic, Pubic.*

The following were much enlarged and firm, and their cortices contained numerous caseous spots.—*Posterior Pharyngeal, Hyoid, Submaxillary, and Subparotid.*

Microscopic Examination.

Tubercle from Thymus.—Tubercle bacilli numerous

CHIMPANZEE 5. (Virus H 52. "L.B.")

Subcutaneous Inoculation of culture derived from human brain through Guinea-pig 1830.

Dose—1·0 milligramme.

Date—August 16th, 1906.

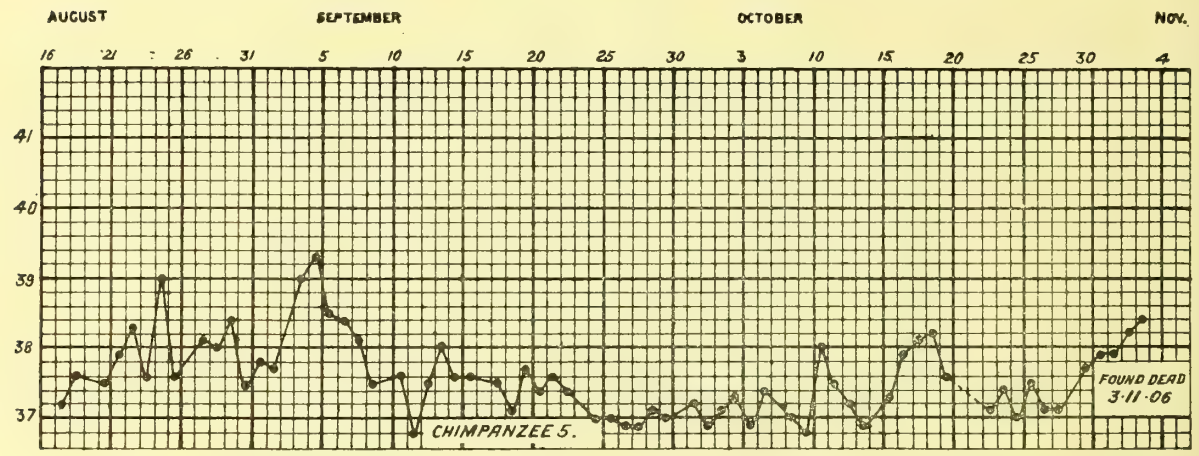
Died—November 3rd, 1906. [79 days after inoculation.]

Weight at Death—5,700 grammes.

Clinical Notes.

A small abscess tumour developed at the seat of inoculation between the shoulders; this opened and discharged three weeks after inoculation. The axillary glands became greatly enlarged and soft, and some discharged their contents through openings in the overlying skin. The animal showed no definite symptoms; towards the end of the second month it became very quiet and looked thin. It was found dead on November 3rd, 79 days after inoculation.

Temperature.



POST-MORTEM EXAMINATION.

General Condition.—Thin.

Local Lesion.—In the subcutaneous tissue of the back, between the alæ of the scapulæ, rather to the right of the middle line, there was a flat space ¾ in. in greatest diameter; the skin over it was thickened, puckered, and darkly pigmented, and showed a fistulous opening discharging pus. The cavity was surrounded by a wall of pigmented fibrous tissue 1 mm. in thickness covered internally with a layer of soft yellow caseo-pus.

Axillary Glands.—Just below the fold of the right pectoral muscle there was an oval depressed area, 1 in. by ⅓ in., of reddish brown puckered skin, which showed several irregular fistulous openings discharging pus. On dissection this was found to be situated over and adherent to a group of three or four enlarged glands which had fused together. Around these were numerous smaller separate glands, the whole collection forming a mass, which measured roughly 1 in. in diameter. On section the larger glands were caseous and softened throughout, and had very dense fibrous capsules. The other glands contained caseous nodules of various sizes. Below the fold of the left pectoral muscle there was a small area of brownish black puckered skin, which showed a small sinus in the centre. On section this was found to be situated over, and adherent to, an enlarged and caseous gland, which had softened and discharged most of its contents through the opening in the skin. Near the latter was a larger gland, not adherent to the skin, which was partly caseous. Other glands in the axilla showed a slight degree of enlargement, and each contained one or two caseous tubercles.

Cervical Glands.—Two glands behind the right clavicle, each about the size of a broad bean, were composed throughout of soft greenish-yellow caseo-pus.

Two of the superior cervical glands on this side were slightly enlarged and partly caseous. The rest were normal.

On the left side the gland behind the clavicle contained a caseous tubercle. Of the group of superior cervical glands on this side three contained each one soft yellow tubercle 2 mm. in diameter. (One of these was probably the left retropharyngeal gland.)

Thorax.

Pleura.—The pleural surface of the diaphragm showed numerous glistening transparent tubercles, the largest the size of a pin's head. There were numerous similar tubercles on the costal pleura on the left side.

Lungs.—Were pinkish and crepitant, and collapsed normally. They contained sparsely scattered grey tubercles, the largest about 1 mm. in diameter. On the dorsal surface of the left caudal lobe numerous minute transparent tubercles were just visible. The smaller tubercles were translucent throughout; some of the larger ones were slightly opaque, others were distinctly caseous, in the centre.

Thoracic Glands.—The left bronchial glands appeared normal. The right pre-tracheo-bronchial glands were normal. One of the right inter-tracheo-bronchial glands contained a soft yellow caseous tubercle 1·5 mm. in diameter; another contained a few caseous foci.

Dorsal Mediastinal Glands.—Between the œsophagus and the spine on the right side, at the level of the enlarged vertebral glands, was a large gland measuring 1 in. in length by about a ¼ in. in diameter. It showed on section yellow caseous patches, surrounded by dense white fibrous tissue. In close contact with the bodies of the last four or five vertebræ there was a series of enlarged firm glands, two or three of which were caseous throughout, whilst the others showed caseous foci embedded in a fibroid glandular tissue. On the right side of the vertebral column, at the level of the seventh to ninth interspaces, there was a swelling composed of a group of enlarged caseous and softened glands, surrounded by dense white fibrous tissue. To this tumour the right lower lobe

of the lung was intimately adherent, the visceral pleura in this situation being thickened.

One of the group of precardiac glands was slightly enlarged and beset with opaque white caseous miliary tubercles. Another smaller gland contained two tubercles.

Pericardium.—Normal.

Heart.—Normal.

Abdomen.

Peritoneum, Omentum.—There was a hernial protrusion of omentum through the umbilicus. The omentum was adherent to the sac of the hernia. There was no fluid in the peritoneal cavity.

The omentum contained sparsely scattered glistening tubercles, the largest the size of a pin's head. There were a few similar tubercles on the parietal peritoneum, situated chiefly near the spleen.

On the peritoneum, covering the diaphragm, on the left side, there was a close eruption of transparent granules.

Stomach.—Normal.

Intestines.—In the lower part of the small intestine there were numerous tuberculous ulcers, the largest about 5 mm. in diameter. They became less numerous towards the upper end, only one or two being found in the duodenum. The ulcers had slightly raised margins, caseous floor, and slightly thickened fibrous bases. There were no subperitoneal tubercles and no thickening of the peritoneum.

The mucous membrane of the large intestine showed similar ulcers scattered along its whole length.

Duodenal Gland.—The duodenal gland, just below the head of the pancreas, contained two caseous foci.

Mesenteric Glands.—The glands in the upper half of the mesentery were not apparently enlarged. Nearly all of them, however, contained yellow caseous nodules, ranging from 1 mm. to 3 mm. in diameter. From the middle of the mesentery the glands, and the nodules in them, gradually became larger and larger, the terminal gland being two or three times the normal in size, and its substance almost completely replaced by soft yellow caseous areas. The glands were freely movable between the layers of the mesentery.

Colic Glands.—Most of the colic glands were enlarged, and varied in size from that of a pea to that of a thrush's egg. They resembled on section the ileo-colic glands. The largest of these glands was found on the dorsal surface of the rectum, in the pelvis, and this on section was composed throughout of soft yellow caseous substance surrounded by a dense fibrous capsule.

Ileo-Colic Glands.—Were much enlarged, and ranged in size from a large pea to a thrush's egg. On section their substance was extensively replaced by soft greenish yellow caseous nodules, surrounded by dense fibrous capsules.

Pancreatic Glands.—One on the upper border of the pancreas, near the tail, contained a number of discrete miliary caseous tubercles. On the head of the pancreas two glands, perhaps a little enlarged, were beset with caseous tubercles, ranging in size from a millet seed to that of a barley grain. Several smaller glands on the pancreas contained each one or two small caseous tubercles.

Spleen.—Was a little enlarged, and measured 4½ in. by 2 in. by 1 in. in its greatest thickness. On the surface, under the capsule, fairly numerous yellow tubercles were seen. Some of these caused slight projections, which were surrounded by a delicate fringe of fibrin or a narrow ring of thickened capsule. The pulp contained numerous soft yellow caseous tubercles, ranging in size from a pin's head to that of a hemp-seed; the smaller ones had narrow grey margins.

The glands in the hilum of the spleen appeared normal.

Liver.—The liver was pale, and showed throughout the substance fairly numerous greyish translucent tubercles, ranging in size from a mere point up to almost 1 mm. in diameter. There were, besides, a few larger tubercles with caseous centres, and about half a dozen soft yellow caseous nodules, varying from 3 mm. to 8 mm. in diameter.

Portal Glands.—Two small glands in the portal fissure contained each a few small caseous tubercles.

Kidneys.—The kidneys were pale. The right showed in the cortex an irregular whitish caseous nodule about three millimetres in diameter, and sparsely scattered pale grey tubercles with opaque yellowish centres, up to a millimetre in diameter. The left showed a few similar tubercles. These small tubercles were seen with difficulty, on account of the pallor of the kidney tissue.

Suprarenals.—Normal.

Lumbar Glands.—There were numerous glands in front of the lumbar vertebrae; all were distinctly enlarged and congested, and contained each one or two small caseous tubercles.

Iliac Glands.—The right contained altogether four caseous tubercles, the largest 2 mm. in diameter. The left iliac glands appeared to be normal.

Ilio-Sacral Glands.—One small ilio-sacral gland was caseous throughout.

Special Glands.

Inguinal.—One of the left inguinal glands contained a group of yellow caseous tubercles; another contained a single one. Two of the glands on the right side contained discrete caseous tubercles.

Retro-pharyngeal.—The one on the right side was enlarged, and contained four soft yellow caseous nodules, the largest the size of a pea. The left pharyngeal gland was not found. It was probably removed when examining the superior cervical glands.

Tonsils.—The right tonsil, slightly enlarged (?), was congested, and showed on section several soft caseous areas up to 2 millimetres in diameter. The left tonsil was not congested, and apparently normal in size. It showed two soft caseous foci. Neither tonsil was ulcerated.

Brain.—There was a considerable amount of oedema fluid in the sub-arachnoid space. No tubercles were seen on the membranes or in the substance of the brain.

Microscopic Examination.

Emulsion of Colic Gland.—Few tubercle bacilli.

Scraping from Right Tonsil.—Numerous tubercle bacilli.

PIG 65. (Virus H 59. "L.B.")

Subcutaneous Inoculation of culture derived from human brain, through G.P. 1860.

Dose—50 milligrammes.

Date—August 16th, 1906.

Killed when dying—September 15th, 1906. [30 days after inoculation.]

Weights.

	cwts.	qrs.	lbs.
August 16th, 1906 - -	0	0	24
September 15th, 1906 - -	0	0	21

Total loss of weight.—3 lbs.

POST-MORTEM EXAMINATION.

General Condition.—Thin.

At the Seat of Inoculation, on the left abdominal wall, was a circular ulcer $2\frac{1}{2}$ in. in diameter.

The nearest Precrural Gland was enlarged, and largely fibro-caseous.

The Left Iliac Gland was enlarged and similar to the above.

Pleura.—Normal.

The Lungs were thickly packed with grey tubercles, some translucent and rather darker than the rest of the lung, about $\frac{1}{16}$ in. to $\frac{1}{8}$ in. in diameter, and having a trace of central opacity; others larger, lustrous like mother-of-pearl, and slightly raised. Many were confluent.

Section showed large numbers of these tubercles, confluent, so that but little air-containing tissue remained. The section appeared peppered with little opaque yellowish dots, the centres of the tubercles.

The Thoracic Glands were enlarged, and chiefly composed of fibro-caseous tissue.

Heart.—Normal.

Omentum and Peritoneum.—Normal.

Intestines.—Normal.

Mesenteric Glands.—Normal.

The Liver was thickly studded with little whitish tubercles, many raised above the surface. Similar tubercles were thickly scattered throughout the organ.

The Portal Glands were enlarged and resembled the thoracic.

The Spleen was packed with tubercles.

The Kidneys showed a few tubercles on their surfaces, and one or two or section.

The Suprarenals were normal.

The Lumbar and Renal Glands were packed with tubercles.

The Testes each contained a small tubercle.

Tongue, Pharynx, Larynx, Trachea.—Normal.

Various Lymphatic Glands.

Right Iliac and Right Precrural.—Contained many tubercles just commencing to caseate.

Axillary and Prescapular.—Contained many tubercles just commencing to caseate.

Submaxillary and Hyoid.—Normal.

Microscopical Examination.

Tubercle from Axillary Gland.—Tubercle bacilli.

PIG 59 (Virus H 59. "L.B.")

Subcutaneous Inoculation of culture derived from human brain, through G.P. 1860.

Dose—10 milligrammes.

Date of Inoculation—August 16th, 1906.

Died—October 25th, 1906. [70 days after inoculation.]

Weights.

	cwts.	qrs.	lbs.
August 16th, 1906 - - -	0	0	24
October 25th, 1906 - - -	0	1	2

Total gain of weight.—6 lbs.

POST-MORTEM EXAMINATION.

General Condition—Thin.

Local Lesion.—At the seat of inoculation, on the left side of the abdomen, was an irregular ulcerated area two inches in greatest diameter, the floor of which was covered with a layer of yellow caseous substance, varying in thickness, dry, brown, and fissured superficially. This caseous layer extended under the skin around the margins of the ulcer for some distance in a posterior direction. The tissues beneath the layer were thickened and fibroid.

Extending from the lesion towards the superficial inguinal glands were three or four irregularly thickened and caseating cords, the largest about the diameter of a cedar-wood pencil.

Inguinal Glands.—The superficial inguinal glands on the left side were fused together to form a mass 2¼ in. by 1½ in. by ¾ in. On section the gland nearest the lesion was composed throughout of very dense pinkish-yellow caseated tissue, containing whitish foci and fine wavy streaks of calcification. The other glands, smaller than the preceding, were composed of firm congested translucent grey tissue, containing irregular caseous patches.

The right superficial inguinal glands, little, if at all, enlarged, contained altogether four nodules five millimetres in diameter, with yellow caseous centres, slightly gritty from calcification, and greyish-red translucent margins.

Iliac Glands.—The left iliac glands (two in number) were enlarged. One showed more than half the substance replaced by yellowish friable caseous material, slightly gritty from calcification, while the rest of the gland contained only minute foci of necrosis. The other was practically caseous throughout. The right iliac gland (not enlarged) contained one yellow caseous tubercle the size of a millet seed, and a minute yellow focus.

Abdomen.

Omentum.—The omentum was not thickened. It showed extremely numerous pearly grey tubercles, ranging in size from a point just visible to the eye up to that of a grain of sand. There were besides a few scattered tubercles with caseous centres, each about the size of a millet seed.

Peritoneum.—The peritoneum covering the diaphragm showed on the right side a number of hard grey flattened nodules, the largest 5 mm. in diameter, and numerous minute grey granules. On section the nodules showed very early necrosis. On the left side there were a few similar nodules and granules.

Intestines.—The small intestine was normal.

In the large intestine the colon showed two small submucous nodules with yellow caseous centres. There were a few tuberculous nodules scattered about on the serous surface of the large intestine, varying in size from a small pin's head to that of a hemp-seed. The smaller ones were grey and translucent, and the larger ones had yellow caseous centres and translucent grey margins.

Mesenteric Glands.—Were not enlarged, and contained sparsely scattered yellow caseous gritty tubercles, varying in size from a millet-seed to that of a hemp-seed.

Meso-Colon.—On the meso-colon, between the coils of the large intestine, where they lay in contact with the floor of the abdomen, were clustered extremely numerous tubercles varying in size from a small pin's head to that of a hemp-seed. The smaller ones were grey and translucent, the larger ones had yellow caseous centres and translucent grey margins.

Spleen.—Was enormously enlarged, weighing 6 ozs., and measuring 12 in. in length, 2½ in. in breadth, and about 1¼ in. in greatest thickness. The surface was closely studded with large grey nodules, in places becoming confluent. The largest measured more than a centimetre in diameter. They were slightly raised above the surface, and to many of those on the convexity the omentum was closely adherent. The capsule on the convex surface of the thicker portion showed an irregular patch of thickening of almost cicatricial density.

On section the pulp was found to be extensively replaced by tuberculous nodules. These nodules had a very striking appearance. In the centre there was a yellow caseous focus, which could be readily shelled out; around the periphery a zone of firm reddish grey tissue, not easily differentiated from the surrounding spleen pulp, and containing yellow striæ, arranged chiefly in a radial direction. Between the two there was a broad zone of greenish grey translucent tissue.

Liver.—Was slightly enlarged, and bright red in colour; It showed on the surface a well-marked grey network, due to thickening of the interlobular connective tissue, and numerous grey nodules, the largest about the size of a hemp-seed. On close inspection the liver substance was seen to contain also numerous minute grey foci, suggesting a recent tuberculous infiltration.

On section similar appearances were seen in the depth. The nodules were grey and translucent, had had relatively minute caseous centres, most of which were perceptibly gritty from calcification.

Portal Glands.—Were enlarged, and their substance was extensively replaced by irregular yellow gritty caseous patches of various sizes. The gland substance surrounding these was firmer and greyer than normal.

Kidneys.—Were pale. The right showed on the surface one nodule 2 mm. in diameter, with a caseous centre, and a moderate number of pale grey translucent tubercles, some of which were slightly opaque in the centre. On section three or four miliary tubercles with caseous centres were seen in the depth of the cortex, but, no doubt on account of the pallor of the organ, the small grey tubercles seen on the surface were detected only with difficulty. The left kidney resembled the right.

Suprarenals.—Normal.

Lumbar Glands.—Were slightly enlarged. Each contained two or three irregular yellow gritty caseous tubercles up to a millet-seed in size.

Cœliac Glands.—Were moderately enlarged and felt firmer than normal. On section they showed irregular yellow gritty caseous tubercles and some larger irregular caseous patches.

Thorax.

Pleura.—The costal pleura showed fairly numerous nodules similar to those on the peritoneal surface of the diaphragm. They were arranged chiefly in lines along the anterior margins of the ribs. There were similar nodules on the diaphragmatic pleura. The fringes along the margins of the lungs showed here and there miliary caseous tubercles.

The Lungs.—Collapsed only partially. The ventral portion of the cephalic lobes (more than one half) and the antero-ventral portions of the caudal lobes were dark red, firm, and quite airless. The rest of the caudal lobes were crepitant, but much firmer than normal, and in the posterior parts very emphysematous. The cephalic lobes were adherent to the caudal by recent adhesions. The lung showed on the surface moderately numerous caseous tubercles with grey margins, the largest rather larger than a millet-seed. Some projected from the surface and were somewhat mushroomed. On section similar nodules were evenly distributed throughout the lung substance.

The parenchyma, crepitant as well as consolidated, also contained extremely numerous minute grey tubercles which were more plainly visible on section of the lung than form the surface.

Trachea.—Normal.

Thoracic Glands.—The bronchial glands on both sides were enlarged, and resembled the portal on section.

A ventral mediastinal gland on the left side was much enlarged, and showed more than half its substance composed of dense yellowish white caseous substance, containing opaque whitish streaks and foci of calcification. Two dorsal mediastinal glands each contained an irregular caseous tubercle.

Heart.—In the wall of the right auricle there was a grey nodule about 2 mm. in diameter, which showed on section early foci of necrosis.

Special Glands.

Prescapular.—Both contained two or three caseating nodules, up to the size of a pea.

Cervical.—Were deeply congested, and filled with caseating nodules, ranging in size up to a large pea, and gritty in the centre.

Submaxillary.—Were enlarged, and firmer than normal. On section they were composed of reddish grey tissue, containing small yellow patches of caseation.

The glands near the articulation of the jaw resembled the cervical glands.

Tonsils.—The tonsils were congested, and showed on section a fine yellow network.

Larynx.—The mucous membrane of the larynx showed a congested ulcer 5 mm. in diameter. It had slightly raised thickened margins and a thickened base, but showed no sign of caseation.

Microscopical Examination.

Left Tonsil.—Few tubercle bacilli.

Ulcer from Larynx.—Few tubercle bacilli.

Nodule from Colon.—Few tubercle bacilli.

PIG 67. (Virus 59. "L.B.")

Subcutaneous Inoculation of culture derived from human brain, through G.P. 1860.

Dose—1 milligramme.

Date of Inoculation—August 16th, 1906.

Killed—When in apparently good health. November 8th, 1906. [84 days after inoculation.]

Weights.

	cwt.	qrs.	lbs.
August 16th, 1906 - -	0	0	26
November 8th, 1906 - -	0	1	23

Total Gain of Weight.—25 lbs.

POST-MORTEM EXAMINATION.

General Condition.—Moderately good.

Local Lesion.—On the left side of the abdomen, at the seat of inoculation, there was a small star-shaped puckered and pigmented scar. The subcutaneous tissues beneath the scar were thickened, and showed a moderate number of discrete tubercles, mostly about the size of millet seeds, with fibrous margins and yellow centres, containing minute calcareous particles. In the subcutaneous tissues an inch from the cicatrix, in the direction of the inguinal glands, there was a thin-walled nodule, with greenish pultaceous contents. This nodule was not adherent to the skin.

Superficial Inguinal Glands.—On the left side there was a mass, which measured 1½ in. by 1 in. by ½ in. It was composed of two glands, which had fused together. On section each of these was composed of soft cheesy caseo-purulent material, surrounded by a moderate congested fibrous capsule. Two other small glands on this side contained each a miliary caseous tubercle; another contained a nodule the size of a hemp seed.

On the right side the glands were normal in size, and contained a few discrete caseous gritty tubercles, up to a millet seed in size.

Iliac Glands.—The one on the left side, the size of a broad bean, showed about half its substance yellow and caseous. The one on the right side was congested, but otherwise normal.

Precrural Glands.—The left precrural gland was about three times the size of the right, and contained a firm caseous, slightly gritty, nodule, 1 centimetre in diameter, and a number of smaller ones.

The right precrural gland contained about half a dozen firm caseous nodules, the largest the size of a hemp seed.

Abdomen.

Omentum.—The omentum showed fairly numerous glassy semi-transparent tubercles, the largest about 1 millimetre in diameter. Between the coils of the large intestine, and on the large intestine itself, where it lay in contact with the floor of the abdomen, were numerous hard nodules, ranging in size from a millet seed to that of a hemp seed, with fibrous walls, and dense yellow slightly gritty centres.

Intestines.—The small intestine was normal.

All the solitary lymphoid follicles in the large intestine appeared somewhat enlarged, and showed in the centres a well marked umbilication, which in some was rather wide, and resembled a healed ulcer. There were besides four submucous caseous tubercles, the size of a millet seed.

Gastric Glands.—Two in the lesser curvature contained altogether three caseous tubercles, the largest 2 millimetres in diameter.

Mesenteric Glands.—Most of the mesenteric glands were tuberculous, though not apparently enlarged. Some contained discrete gritty caseous tubercles; in others there were larger caseous nodules, which more or less extensively replaced the gland substance.

Colic Glands.—Resembled the mesenteric glands.

Ileo-Colic Glands.—All the ileo-colic glands were beset with caseous tubercles.

Spleen.—The spleen was greatly enlarged and very firm; it weighed 11 ozs., and measured 12½ in. by 2¾ in. by nearly 1 in. in greatest thickness. It showed on the ventral half of the concave surface, and over a considerable portion of the convex, numerous slightly raised umbilicated grey translucent areas, the largest about 1 centimetre in diameter, forming in places an almost continuous layer. They were covered and largely concealed by long connective tissue outgrowths, matted together, and were caused by a thickening of the capsule over nodules in the substance. The parts of the spleen not covered by these areas were red, and showed through the capsule scattered yellow millet seed sized foci.

On section the spleen presented a rather unusual appearance. The pulp was found to be almost completely replaced by nodules of new growth, the largest measuring about 1·5 centimetre in diameter. Each of these nodules showed a central patch of fibroid tissue, containing a millet seed sized soft yellow caseous focus, surrounded by a broad peripheral zone of greyish yellow tissue, speckled with red points of congestion. The cut surface of the central fibroid patch in each nodule was depressed below the level of that of the marginal zone.

Liver.—Appeared enlarged, and weighed 2 lbs. 8 ozs. The capsule showed a delicate network of fibrous tissue. The substance was pale, very firm, and fibroid, and contained sparsely scattered yellow gritty caseous miliary tubercles, which readily shelled out. Several tubercles were found in the walls of the larger portal veins.

Gall Bladder.—Normal.

Portal Glands.—The portal glands were enlarged, and showed their substance extensively replaced by irregular cheesy areas, very slightly gritty from calcification.

Kidneys.—In the cortex of each kidney there were fairly numerous greyish white tubercles, the largest about the size of a small pin's head, and one or two large tubercles with yellow centres.

Suprarenals.—Normal.

Lumbar Glands.—One on the left side was enlarged, but contained no tubercles: three very small glands along the vena cava contained each a caseous gritty tubercle.

Coeliac Glands.—Were distinctly enlarged. Two showed their substance extensively replaced by softened caseo-calcareous nodules: the rest contained discrete caseous nodules, here and there confluent.

Thorax.

Pleura.—There was well marked hypertrophy of the fringes along the margins of the ribs on the left side. Near the diaphragm the processes were large, soft, and pinkish, but elsewhere they were more slender. They contained a moderate number of hard tubercles with yellow gritty centres, mostly about the size of millet seeds; in the larger growths there were some nodules as large as hemp seeds.

There was a similar condition on the right side, but the connective tissue processes and the tubercles were not so numerous nor so large.

Diaphragm.—On the pleural surface of the diaphragm there was a number of hard translucent tubercles, to which were attached delicate villous connective tissue processes. On the peritoneum covering the diaphragm on the right side there were about thirty translucent tubercles, varying in size from a mere point up to that of a millet seed; the larger of these had minute yellow gritty centres.

Lungs.—Between the right cephalic lobe and the parietal pleura were numerous slender processes of fibroid tissue, which were readily torn through. The left caudal lobe was slightly adherent to the chest wall along its posterior margin.

The cephalic lobes, the right middle lobes, and the antero-ventral corner of each caudal lobe, were collapsed, consolidated, pinkish in colour and quite airless; the rest of the caudal lobes were crepitant. Projecting from the surface were fairly numerous nodules, ranging in size

from a millet seed to that of a hemp seed. Attached to the surface of many of these nodules, as well as to other parts of the visceral pleura, were numerous soft connective tissue outgrowths, some very long, and containing at the extremity a small tubercle.

The fringes around the margins of the lungs were hypertrophied, and contained rows of small hard tubercles with yellow centres.

On section of the lung fairly numerous yellow caseous gritty tubercles, mostly about the size of millet seeds, were evenly distributed throughout the parenchyma. Besides these the lung substance contained extremely numerous minute grey foci, which were just visible, in the crepitant portions only, to the naked eye.

Trachea.—Normal.

Thoracic Glands.—The bronchial glands were enlarged, and composed practically throughout of cheesy gritty caseous substance.

The dorsal mediastinal glands were not enlarged. One contained a pea-sized caseous nodule, the others one or two smaller nodules. The left ventral mediastinal gland was the size of a sparrow's egg, and caseous in more than three quarters of its cortex. The right showed discrete caseous nodules.

Heart.—On the endocardium of the right ventricle there were two minute grey tubercles. With these exceptions the heart was normal.

Genito-Urinary System.

Testicles.—The left testicle contained two hard nodules, one 1 in. the other $\frac{1}{2}$ in. in diameter. These showed on section a firm yellow caseous mass in the centre, surrounded by a broad zone of greyish translucent tissue, with a few necrotic foci. The epididymis was fibroid, and contained a few yellow caseous nodules up to a pea in size.

In the right testicle there was an oval nodule, which measured $1\frac{5}{8}$ in. in length. It was composed of firm greyish somewhat translucent tissue (resembling lymphatic gland tissue), containing scattered pinhead-sized yellow foci. The epididymis of this testicle was a little enlarged, very fibroid, and beset with yellow caseous nodules.

On the right tunica vaginalis there were scattered tubercles. On the left tunica (parietal layer) there was a large patch of tuberculous granulation tissue.

Special Glands.

Prescapular.—The left contained a hemp seed-sized caseous nodule. In the right there were about half a dozen caseous nodules, up to a hemp seed in size.

Prepectoral.—The right contained half a dozen irregular yellow caseous nodules; the left, three miliary tubercles.

Cervical.—Near the articulation of the jaw, on the left side, there was a group of glands. One was dense and caseating throughout; the others contained a few discrete caseous tubercles. The glands in a corresponding position on the right side contained a few discrete caseous tubercles.

The middle and lower cervical glands were normal.

Submaxillary.—In the cortex of each there were a few small yellow caseous gritty tubercles.

Retro-pharyngeal.—Resembled the submaxillary.

Tongue.—Normal.

Tonsils.—The tonsils contained numerous soft greenish yellow caseous tubercles, each about the size of a millet seed.

Pharynx, —Normal.

Larynx.—Normal.

Microscopical Examination.

Pus from Nodule at Seat of Inoculation.—No tubercle bacilli or other micro-organisms seen.

Tubercle from Tonsil.—Tubercle bacilli scanty.

PIG 73. (Virus H 59. "L.B.")

Subcutaneous Inoculation of culture derived from human brain, through Guinea-pig 1860.

Dose—0·1 milligramme.

Date—August 16th, 1906.

Killed—When in good health. November 10th, 1906. [86 days after inoculation.]

Weight.

	qrs.	lbs.
August 16th, 1906 - - - -	1	1
November 10th, 1906 - - - -	2	15

Total gain of weight.—1 qr. 14 lbs.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—At the seat of inoculation, on the left side of the abdomen, there was a scar 1 in. by $\frac{5}{8}$ in., showing in the centre a dry scab.

On section through this the skin was found to be thickened, and to contain a few caseous nodules, the largest 2 millimetres in diameter. There were no tubercles in the subcutaneous tissues, but one miliary caseous tubercle was found in the muscles under the scar.

Superficial Inguinal Glands.—On the left side two glands were fused together to form a mass measuring $1\frac{1}{2}$ in. by 1 in. by $\frac{7}{8}$ in. On section they were composed throughout of dense pinkish and yellowish caseated tissue containing fine calcareous streaks. Another small gland in this group was partly caseous; the rest were normal.

On the right side the glands were slightly enlarged, and contained numerous firm congested caseating nodules, the largest the size of a large pea.

Iliac Glands.—The left iliac gland was much enlarged, and measured 2 in. by $1\frac{1}{4}$ in. by $\frac{3}{4}$ in. On section it was composed throughout of yellow, friable, caseo-calcareous substance, intersected by fibrous trabeculæ The right iliac gland measured $\frac{3}{4}$ in. by $\frac{1}{2}$ in., and contained one large pea-sized caseating nodule.

Precrural Glands.—The left was slightly enlarged, and contained two firm yellow caseous nodules, the largest the size of a large pea. The right contained two small caseating nodules.

Abdomen.

Peritoneum, Somatic and Visceral.—On the coils of the large intestine there were about half a dozen miliary caseating tubercles. The parietal peritoneum covering the diaphragm presented numerous small villous tags of connective tissue, and on the right side numerous small hard tubercles.

Omentum.—Showed sparsely scattered pearly tubercles.

Intestines.—Normal.

Gastric Glands.—These glands were much enlarged, and resembled on section the portal glands.

Mesenteric Glands.—The mesenteric glands, with few exceptions, contained firm yellow caseous nodules, the largest about 1 centimetre in diameter. In the terminal gland they were rather numerous, but in the others they were sparsely scattered.

Colic Glands, Ileo-Colic Glands.—Also contained caseous nodules.

Spleen.—Was greatly enlarged; it measured 15 in. by $2\frac{3}{4}$ in. by $1\frac{1}{8}$ in., and weighed 13 ozs. The substance was filled with large nodules, some nearly 1 in. in diameter, which formed conspicuous rounded prominences on the surface; the majority of these prominences were greyish white and fibrous looking, and were covered by capsule only; others were separated from the capsule by a thin layer of splenic tissue. Many of the former had attached to them long processes of connective tissue.

On section the nodules were found to be composed of firm grey translucent tissue, rather more fibrous looking in the centre than around the margins. They contained soft yellow caseous foci, grouped chiefly around the fibrous centre; a large number showed a recent hæmorrhage into the fibrous centre.

Liver.—The liver was enlarged (weight 3 lbs. 1 oz.), pale and very dense and fibroid. It showed on the surface extremely numerous minute grey tubercles, and under the capsule a moderate number of fibrous nodules with yellow caseo-calcareous centres, the largest the size of a hemp seed; similar nodules were evenly but sparsely distributed throughout the substance of the liver. The cut surface showed also minute grey points, more distinctly visible in some places than in others; these were probably early tubercles, and were seen with difficulty on account of the pallor of the liver tissue, and the thickening of the interlobular connective tissue.

Portal Glands.—In the small omentum there was a group of six enlarged glands, the largest measuring $1\frac{5}{8}$ in. by $\frac{3}{4}$ in. by $\frac{1}{2}$ in. On section they were all composed throughout of firm yellow friable caseous substance, distinctly gritty from calcification.

Kidneys.—Each kidney showed in the cortex sparsely scattered grey miliary tubercles, a few of which were slightly opaque and even yellowish in the centre.

Suprarenals.—The right contained three grey tubercles, the largest 1 millimetre in diameter; the left contained two similar tubercles.

Lumbar Glands.—Normal.

Cœliac Glands.—Two were slightly enlarged and on section irregularly caseated; two others contained each one or two yellow foci. One large nodular gland, $1\frac{3}{4}$ in. by 1 in. by $\frac{3}{4}$ in., showed on section large irregular yellow patches of caseation, replacing more than half the gland.

Ilio-Sacral Glands.—One on the left side showed a small patch of early caseation. The one on the right was normal.

Thorax.

Pleura.—Except for a few slender connective tissue processes, the costal pleura was normal.

On the pleura covering the diaphragm there was a moderate number of flattened grey translucent nodules, covered with villous connective tissue processes.

Lungs.—The lungs were crepitant throughout, and collapsed well. There were no adhesions. On the surface there were several processes of connective tissue, a few of which showed at the free extremity a lenticular caseous tubercle.

The lung parenchyma contained sparsely scattered yellow caseo-calcareous nodules with fibrous capsules, ranging in size from that of a millet seed to that of a hemp seed, and extremely numerous small grey tubercles (none larger than 1 mm. in diameter), the majority only slightly opaque, but some distinctly yellow in the centre.

Trachea.—Normal.

Thoracic Glands.—The bronchial glands were much enlarged and very indurated. On section they resembled the portal glands, but were not quite so extensively caseated.

The dorsal mediastinal glands were slightly enlarged, and contained caseating nodules of various sizes.

Of the ventral mediastinal glands, the left was enlarged and about three-quarters caseous. The right showed a small nodule in a state of early caseation.

Heart.—Normal.

Special Glands.

Prescapular.—Each contained a pea-sized fibro-caseous nodule.

Prepectoral.—Normal.

Cervical.—One on the right side contained several yellow tubercles. On the left side two were enlarged,

indurated, and irregularly caseated. Three others contained each a fibro-caseous nodule, the largest the size of a pea.

The superior cervical glands, at the articulation of the jaw, on each side contained dense caseating nodules.

Submaxillary.—These glands were much enlarged, very dense, and on section advanced in caseation.

Pharyngeal.—The right contained several small irregular yellow caseous patches. The left was normal.

Tongue.—Normal.
Tonsils.—Normal.
Palate.—Normal.
Pharynx.—Normal.
Larynx.—Normal.

PIG 63. (Virus H 59. "L.B.")

Fed—With culture derived from human brain, through Guinea-pig 1860.

Dose.—10 milligrammes.

Date—August 16th, 1906.

Killed—When in good health, November 12th, 1906. [88 days after inoculation.]

Weights.

	qrs.	lbs.
August 16th, 1906 - - - -	0	22
November 12th, 1906 - - - -	1	24

Total gain of weight.—1 qr. 2 lbs.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Tonsils.—The left tonsil showed an ulcer, ½ in. in greatest diameter, with very irregular margins and floor; the base was slightly thickened and showed a few yellow caseous foci. On the right tonsil there was one irregular ulcer, about ¼ inch in greatest diameter, and one very small ulcer. Neither of these showed definite thickening or caseation of the subtonsillar tissue.

Submaxillary Glands.—The one on the right side, very lobulated, measured 1¾ in. by 1¼ in. by ¾ in. and showed about two-thirds of its substance composed of dense congested yellowish caseous substance, slightly gritty from calcification and containing some recent hæmorrhages. In the remaining third there were streaks of early caseation. A small gland near the latter contained some fine streaks of early caseation.

The gland on the left side was very similar to that on the right.

Pharyngeal Glands.—Right normal. Left contained a pea-sized caseating nodule.

Cervical Glands.—The left lower cervical gland contained a small caseous focus. The left mid-cervical gland contained a pea-sized grey nodule with caseous foci.

Of the group of glands near the articulation of the jaw, on the left side, one, the size of a broad bean, was composed almost throughout of grey translucent tissue, containing irregular coarse streaks of caseation; another showed a pea-sized caseating nodule.

On the right side two of the glands near the articulation of the jaw were dense, pinkish yellow, and caseous throughout, and slightly gritty from calcification. Other cervical glands on this side were normal.

Abdomen.

Peritoneum.—On the peritoneal surface of the diaphragm were about a dozen nodules, similar to, but smaller than, those on the pleural surface; the larger ones contained minute yellow points.

On the serous surface of the large intestine there were a few tubercles, larger than those in the omentum, with distinctly caseous gritty centres.

Omentum.—The omentum contained about half-a-dozen grey miliary tubercles with minute opaque centres.

Stomach.—The mucous membrane of the cardiac end of the stomach showed a few small ulcers with thick raised margins, showing no sign of caseation, and about a dozen sub-mucous caseous nodules, the largest the size of a hemp seed, over which the mucous membrane was intact.

Intestines.—Most of the Peyer's patches in the small intestine showed small smooth depressions or pits, which were apparently healed ulcers. The lymphoid tissue beneath them was atrophied, and the mucous membrane around them in several instances was distinctly puckered. From the serous surface these patches were seen to contain scattered yellow caseous tubercles, the largest the size of a millet seed; the mucous membrane over these tubercles was not ulcerated.

Large Intestine.—Two lymphoid follicles in the cæcum were enlarged, but not caseous; otherwise the large intestine was normal.

Mesenteric Glands.—The mesenteric glands were much enlarged, and formed a convoluted mass, which weighed 10 ozs.

On section all the glands were composed throughout of firm friable yellow caseous substance, distinctly gritty from calcification: the capsules of the glands were thickened.

Colic Glands.—Many of the colic glands were slightly enlarged, and on section irregularly caseated.

Ileo-Colic Glands.—These glands were also much enlarged, and resembled on section the mesenteric.

Spleen.—The spleen was not apparently enlarged. It weighed 1¾ ozs., and measured 7 in. by 2¼ in. by ½ in. It contained a moderate number of nodules (forty counted on the convex surface) varying much in size, many of which projected prominently from the surface. The largest measured about 1·5 centimetres in diameter, the smallest was about the size of a millet seed. The nodules were composed of firm grey transulcent tissue, congested around the margins, containing yellow caseous foci, showing a tendency to a radial arrangement around the centre of the nodule; in many of the smallest nodules no foci of caseation could be detected.

Splenic Gland.—A lymphatic gland in the hilum of the spleen, the size of a lark's egg, was composed throughout of dense pinkish-yellow slightly gritty caseated substance.

Liver.—The liver was crowded with grey nodules, ranging in size from a mere point up to from 5 to 6 millimetres in diameter. The smallest ones were homogeneous throughout; the larger ones had yellow caseous centres, not perceptibly gritty, which readily shelled out. The substance of the liver between the nodules had a more or less normal appearance.

Gall Bladder.—Normal.

Portal Glands.—The portal glands were much enlarged, the largest measuring rather more than an inch in greatest diameter. On section they were indurated and advanced in caseation. The caseous areas were congested, waxy white in colour, and contained opaque yellowish-white streaks and foci of early calcification.

Kidneys.—The left kidney showed in the cortex, just beneath the capsule, two pearly-grey tubercles, each about 0·5 millimetre in diameter. The right kidney was normal.

Suprarenals.—Normal.

Lumbar Glands.—One was slightly enlarged, firmer than normal, and closely beset with irregular yellow congested caseous foci.

Cœliac Glands.—The cœliac glands were very indurated and much enlarged, the largest measuring 1¼ in. by 1 in. by ¾ in. On section one was composed practically throughout of dense yellowish-white congested caseated tissue, distinctly gritty from calcification. The others were not so extensively caseated, showing irregular patches and streaks, surrounded by firm greyish translucent tissue.

Iliac Glands.—Normal.

Thorax.

Pleura.—The costal pleura was normal.

Diaphragm.—On the pleural surface there were four grey nodules, the largest the size of a hemp seed. On the peritoneal surface there were about a dozen similar but smaller nodules; the larger ones contained minute yellow points.

Lungs.—The lungs were crepitant and collapsed normally. They contained fairly numerous evenly distributed grey miliary tubercles, with yellow caseous centres, and a few rather larger nodules, with broad grey translucent margins and yellow caseous centres (the latter resembled the larger nodules in the liver). One of the subpleural nodules showed on the surface a short connective tissue process containing a small yellow tubercle.

Thoracic Glands.—The bronchial glands were only slightly enlarged, and not very severely affected. They showed on section a few irregular, congested, somewhat translucent caseating patches containing very early foci of calcification.

A small dorsal mediastinal gland, slightly enlarged, was in a state of early caseation.

The central mediastinal glands were slightly enlarged, indurated, and showed on section numerous small irregular yellowish congested caseous patches.

Heart.—Normal.

Genito-Urinary System.

Uterus, Ovaries.—Normal.

Special Glands.

Prescapular, Prepectoral, Precrural.—Normal.

Superficial Inguinal.—One on the left side contained a small firm irregularly caseated nodule. Those on the left side contained two greyish-yellow congested caseous nodules, the largest 3 millimetres in diameter.

Microscopical Examination.

Tonsil.—One tubercle bacillus seen.

Small Intestine (tubercle from).—Two tubercle bacilli seen.

Cardiac End of Stomach (tubercle from).—No tubercle bacilli seen.

PIG 71. (Virus H 59. "L.B.")

Fed—With culture derived from human brain, through Guinea-pig 1860.

Dose—1 milligramme.

Date—August 16th, 1906.

Killed—When in good health, November 13th, 1906. (89 days after inoculation.)

Weight.

	qrs.	lbs.
August 16th, 1906 - - - -	1	3
November 13th, 1906 - - - -	2	22

Total gain of weight.—1 qr. 19 lbs.

(This pig had grown better than any of its fellows.)

POST-MORTEM EXAMINATION.

General Condition.—Body in very good condition.

Tonsils.—Each tonsil showed on the surface a minute depressed bluish scar; there was no sign of caseation in the tonsillar substance.

Pharynx, Larynx.—Normal.

Submaxillary Glands.—On the right side one measured 1 in. by 1 in. by $\frac{3}{4}$ in., and was composed throughout of dense, slightly gritty, caseous substance, pinkish in the centre, more yellow around the margins, surrounded and intersected by fibrous tissue. Two smaller glands contained caseous points.

On the left side one, rather less in size than the large one on the right side, showed on section three yellowish white caseous masses, slighty gritty from calcification, which replaced about three-quarters of the gland substance. A small gland near the latter was normal.

Retropharyngeal Glands.—Normal.

Cervical Glands.—The glands near the articulation of the jaw on each side were normal, as were also the glands in the middle and lower part of the neck.

Abdomen.

Peritoneum.—On the peritoneal surface of the diaphragm on the right side, were two millet-seed sized grey tubercles, and a few small connective tissue processes. Peritoneum otherwise normal.

Omentum.—The omentum contained about half a dozen pinhead-sized tubercles with caseous centres.

Stomach, Intestines.—Normal.

Mesenteric Glands.—The glands in the anterior two thirds of the mesentery were not enlarged, but showed at fairly frequent intervals greyish white, semi-opaque, slightly gritty, caseous nodules, varying in size, the largest being about 1 cm. in diameter. One gland was caseous throughout. In the lower third of the mesentery the glands were distinctly enlarged, and their substance more extensively replaced by caseous areas, which were generally larger than those in the anterior part; a few of the glands were caseous throughout. The caseous masses were firm, and could be readily shelled out from a delicate fibrous capsule; when removed they were yellowish and warty externally.

Colic Glands.—Two contained each one hemp-seed sized caseous nodule.

Spleen.—The spleen was normal in size, and contained about a dozen soft caseous tubercles, with delicate fibrous capsules, ranging in size from 1 to 2 mm. in diameter; the tubercles were not perceptibly gritty.

Liver.—The liver was normal in size and general appearance. It showed, scattered evenly throughout the substance, not very numerous (four to six counted in a square inch of the surface), yellow caseous tubercles with narrow grey margins, ranging in size from 1 to 2 mm. in diameter.

Portal Glands.—The portal glands were slightly enlarged and showed on section discrete caseous nodules 1 to 4 mm. in diameter. The larger ones were irregular in outline, and appeared to be composed of small tubercles aggregated together.

Kidneys Suprarenals.—Normal.

Lumbar, Glands.—Normal.

Cœliac Glands.—On the left pillar of the diaphragm, between it and the cardiac end of the stomach, there was a group of glands, not apparently enlarged, which showed on section discrete, firm, gritty, caseous nodules, ranging in size from a millet-seed to a hemp-seed.

Iliac Glands.—Normal.

Thorax.

Pleura.—On the pleural surface of the diaphragm there was one small shotty tubercle.

On the costal pleura there were two small deeply hæmorrhagic tubercles, attached to the wall of the thorax by slender connective tissue pedicles.

Lungs.—The lungs were pinkish, crepitant, and collapsed normally. They contained a moderate number of evenly distributed shotty caseous tubercles with grey margins, ranging from 1 to 2 mm. in diameter; some of these tubercles were just perceptibly gritty. There were besides a few larger tubercles, the size of hemp-seeds, and in the left caudal lobe there was a caseous nodule the size of a pea.

Trachea.—Normal.

Thoracic Glands.—The bronchial glands were not enlarged. The left contained a few small caseous tubercles and two or three caseous nodules the size of peas. Other bronchial glands contained a few small caseous tubercles only.

The dorsal mediastinal glands were normal, as were also the ventral mediastinal glands.

Pericardium, Heart.—Normal.

Genito-Urinary System.

Testicles.—Normal.

Special Glands.

Prescapular.—The left contained a few whitish, slightly gritty, caseous nodules, the largest 7 mm. in diameter. The right was normal.

PIG 57. (Virus H 59. "L.B.")

Fed—With culture derived from human brain, through Guinea-pig 1860.

Dose—0·1 milligramme.

Date—August 10th, 1906.

Killed—When in good health, November 14th, 1906. [90 days after inoculation.]

Weight.

	cwt.	qrs.	lbs.
August 16th, 1906 - - -	0	0	22
November 14th, 1906 - - -	0	1	26

Total gain of weight.—1 qr. 4 lbs.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Tongue.—Normal.

Tonsils.—The left showed in the depth a pinhead-sized soft yellow focus. The right was perfectly normal.

Pharynx.—Normal.

Larynx.—Normal.

Submaxillary Glands.—The left submaxillary gland was slightly enlarged, and showed on section two small dense caseous patches, and several discrete miliary caseous foci, very irregular in outline. The right submaxillary gland was normal.

Pharyngeal Glands.—Normal.

Cervical Glands.—Normal.

Abdomen.

Peritoneum.—On the peritoneal surface of the diaphragm there were ten slightly raised hard grey nodules, the largest 5 millimetres in greatest diameter; all on section showed yellow points in the centre. The peritoneum was otherwise normal.

Omentum.—The omentum contained fairly numerous hard grey tubercles, with caseous centres, the largest the size of a millet seed.

Intestines.—Normal.

Mesenteric Glands.—All the mesenteric glands in the lower part of the mesentery were enlarged and practically caseous throughout. The majority of the glands in the anterior part were also enlarged and caseous; some were partly caseous, only a few were normal. They weighed when stripped of the mesentery 5 ozs. The caseous substance was firm, greyish-yellow, in some places pinkish, slightly gritty from calcification, and readily shelled out from a very delicate fibrous capsule.

Colic Glands.—One colic gland, the size of a kidney bean, contained two yellow caseous nodules. The rest were normal.

Mesocolon.—There were a few tubercles, similar to those on the omentum, on the mesocolon, between the coils of the large intestine, in contact with the floor of the abdomen.

Ileo-Colic Glands.—These glands were enlarged. Some were caseous throughout; the others were partly caseous.

Spleen.—The spleen was not enlarged, but contained about a dozen small grey tubercles, yellow and caseous in the centre, 1·5 to 2·5 millimetres in diameter, and four larger nodules 6 to 10 millimetres in diameter. The latter projected prominently from the surface, and showed on section a yellow caseous centre, surrounded by a broad zone of greyish translucent tissue, containing indefinite streaks of necrosis. The nodules were not calcareous.

Liver.—The liver contained rather numerous (11 to the square inch on the surface) firm caseous nodules with narrow grey translucent margins, ranging in size from 1 to 4 millimetres in diameter. The liver substance between the nodules was normal in general appearance.

Gall Bladder.—Normal.

Portal Glands.—The portal glands were much enlarged, the largest measuring 2 in. by $1\frac{1}{4}$ in. On section they were composed of irregular firm yellow caseous patches of various sizes, embedded in a very dense fibroid glandular tissue.

Kidneys.—Normal.

Suprarenals.—Normal.

Two pea-sized glands near the right suprarenal body were practically caseous throughout.

Lumbar Glands.—Two, the size of a pea, were indurated, and on section irregularly caseated.

Coeliac Glands.—The coeliac glands were moderately enlarged, very indurated, and showed on section discrete yellow caseous nodules, which varied in size up to that of a pea.

Iliac Glands.—Normal.

Sacro-Iliac Glands.—Normal.

Thorax.

Pleura.—On the pleural surface of the diaphragm there were about ten nodules similar to those on the peritoneal surface; attached to the surface of one of these was a soft pinkish connective tissue outgrowth. The costal pleura showed no tubercles.

Lungs.—The right lung was adherent to the wall of the thorax by numerous long slender connective tissue processes, which were not readily torn through. The left lung was free from adhesions. Both lungs were pinkish and crepitant, and collapsed normally. They contained moderately numerous discrete hard caseous tubercles with grey margins, ranging in diameter from 1 to 2 millimetres, and several larger greyish red nodules, with relatively small yellow caseous centres. The caseous centres were not perceptibly gritty.

Trachea.—Normal.

Thoracic Glands.—The bronchial glands were slightly enlarged, and showed on section dense yellow caseating patches of various sizes. The dorsal mediastinal glands were normal.

Special Glands.

Precrural.—Normal.

Superficial Inguinal.—Normal.

Microscopical Examination.

Focus from Left Tonsil.—No tubercle bacilli.

VIRUS H 61. "E.C."

MESENTERIC GLANDS and BRAIN. (Post-Mortem.)

VIRUS H 61. "E.C."

CULTURE INOCULATIONS.

MESENTERIC GLANDS.

March 30th, 1906.

Strain derived from human mesenteric glands, direct.

Total duration of artificial cultivation: 2 months.

Culture used for injection: 4th, 21 days old, on pure bovine serum.



BULL-CALF 1015.

Subcutaneous.

Dose: 183 mg.

Killed, June 28th, 1906.

90 days.

P.M.—Small local lesion; nearest gland caseo-necrotic. Two calcareous tubercles in lung, one in suprarenal, in bronchial gland, and in small intestine. (S.T.)

RABBITS.

833	10 mg.	K. 90 days	Slight tuberculosis of peritoneum, lungs and kidneys.
834	1 mg.	K. 90 days	Very slight tuberculosis of peritoneum, lungs and kidneys.
835	1· mg.	K. 90 days	Slight tuberculosis of peritoneum and kidneys. Trace in lungs.

BRAIN.

April 9th, 1906.

Strain derived from human brain, through Guinea-pig 1837.

Total duration of cultivation: 4 weeks.

Culture used for injection: 2nd, 21 days old, on pure bovine serum.



BULL-CALF 1031.

Subcutaneous.

Dose: 50 mg.

Killed, July 10th, 1906.

92 days.

P.M.—Small local abscess tumour. Fibro-calcerous nodules in adjoining lymphatic glands. (L.T.)

MONKEY 73.

Subcutaneous.

Dose: 0·01 mg.

Died, July 7th, 1906.

89 days.

P.M.—General tuberculosis.

MONKEY 75.

Subcutaneous.

Dose: 0·1 mg.

Died, July 2nd, 1906.

84 days.

P.M.—General tuberculosis.

MONKEY 77.

Subcutaneous.

Dose: 1·0 mg.

Died, July 31st, 1906.

113 days.

P.M.—General tuberculosis.

RABBITS.

848	10 mg.	K. 92 days	Trace of tuberculosis in cœcum and left kidney.
849	1 mg.	K. 92 days	Trace of tuberculosis in peritoneum and kidneys.

VIRUS H 61. "E.C."

E.C., Female Child, Aged Six and a Half Years, Admitted to Hospital on January 23rd, 1906, suffering from Meningitis. Died January 28th, 1906, of Tuberculous Meningitis.

Family History.—Father's mother and one uncle died of phthisis. One brother died in infancy of "water on the brain"; four other brothers and sisters living.

Clinical History.—About a month before admission, in December, 1905, the child suffered from measles. She returned to school on January 8th. A week later she suffered from headache and loss of appetite. She had vomited frequently four days before being brought to the hospital, and had become drowsy.

Condition on Admission.—The child was semi-conscious and restless; the eyes were shut, and the legs flexed; the head was not retracted. There was a slight internal squint, and on ophthalmoscopic examination choroidal tubercles were seen. There were no lung symptoms, and no abdominal symptoms were noted.

The child died on January 28th, five days after admission.

POST-MORTEM EXAMINATION.

Meninges of Brain.—A few scattered tubercles were seen on the upper surface. There was a considerable amount of clear exudation at the base of the brain, and many scattered tubercles in the Sylvian fissure, and along the optic tracts.

Thorax.

Lungs.—Were full of grey tubercles in both apices, some commencing to caseate.

Bronchial Glands.—Were enlarged and caseating.

Abdomen.

Peritoneum and Intestines.—Were healthy.

Mesenteric Glands.—Were enlarged, and many contained yellow foci.

Liver.—Showed a few scattered tubercles on the surface.

Spleen.—Was full of grey tubercles.

Kidneys.—There was a caseous mass in the right kidney, and many scattered tubercles were seen in the capsules of both organs.

DESCRIPTION OF MATERIAL RECEIVED AT BLYTHWOOD.

Portion of Brain and Meninges.—A few minute opaque foci were seen, some in the meninges, others apparently in the brain substance.

Mesenteric Glands.—Were slightly enlarged, the largest ranging in size from a pea to a small French bean. Numerous yellow foci could be seen from the peritoneal surface of many of these glands, and on section the gland substance was seen to be studded with small yellow pinhead tubercles. Other glands contained fibrous nodules, with small caseating points. In many of the small glands in the mesentery also tuberculous foci could be seen.

Portion of Lung.—The lung showed on the surface very numerous grey translucent miliary tubercles, in some of which opaque centres could be seen. Part of the lung was dark red in colour, and over this portion the surface was covered by innumerable miliary tubercles.

On section the lung was seen to contain very numerous grey miliary tubercles sometimes confluent. No cavities were found in the portion of the lung received.

Bronchial Glands.—Of the glands received two of the largest were found on section to consist mainly of greenish white caseous areas, slightly pigmented; the gland tissue which remained was congested, and opaque points could be seen in it. Three or four pea-sized bronchial glands showed opaque foci in their cortices.

Microscopical Examination.

Tubercle from Lung.—Tubercle bacilli, few.

Scraping from Bronchial Gland.—Tubercle bacilli, few.

Emulsion of Brain.—No tubercle bacilli seen.

Tubercles from Mesenteric Gland (three films examined).—No tubercle bacilli seen.

Emulsion of Mesenteric Glands.—Only one tubercle bacillus found.

CALF 1015. (Virus H 61. "E.C.")

Subcutaneous Inoculation of culture derived from human mesenteric glands.

Dose—183 milligrammes.

Date—March 30th, 1906.

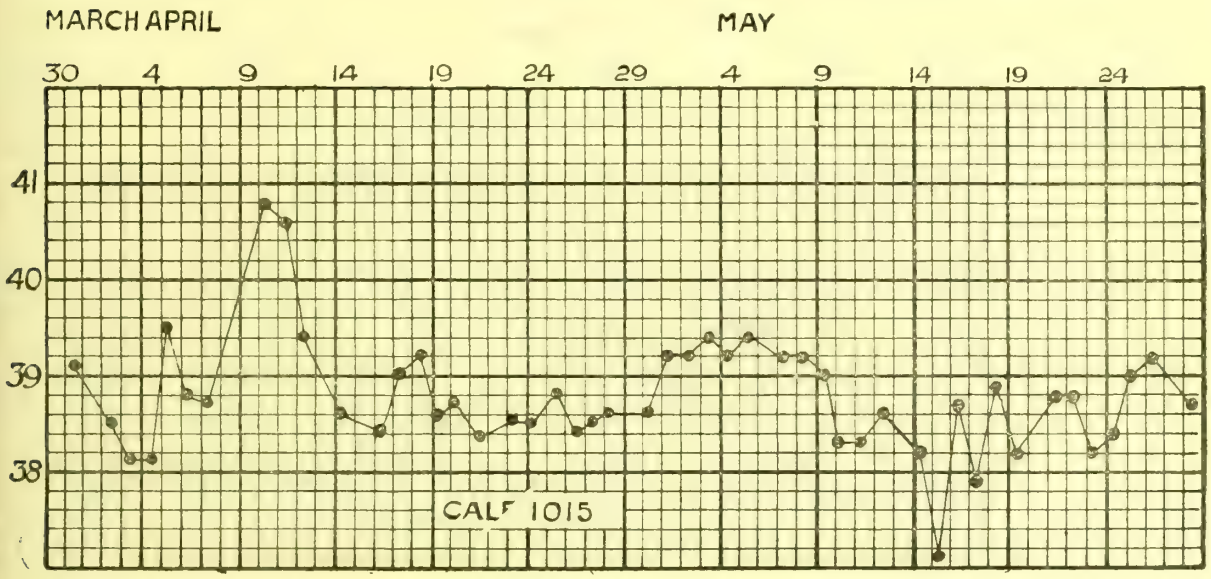
Weight at Inoculation—1 cwt. 0 qr. 14 lbs.

Killed—June 28th, 1906. [90 days after inoculation.]

Clinical Notes.

The calf was inoculated on March 30th, 1906. About 10 days later the calf was ill, and looked very much like one injected with a virus of Group I. It remained thin and continued to look ill for some weeks, and was still in somewhat poor condition when killed on June 28th, 90 days after inoculation.

Temperature.



From May 28th to June 28th, when the calf was killed, the temperature remained approximately normal.

Weights.

	cwt.	qrs.	lbs.
March 30th, 1906 - - -	1	0	14
June 28th, 1906 - - - -	1	0	22

Total gain of weight during experiment—8 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Thin.

At the Seat of Inoculation, at the right side of the neck, was a depressed sinus leading into dense fibrous tissue containing a few calcareous grains.

The Right Prescapular Gland was moderately enlarged, 3 in. in length. It was salmon-pink and caseo-necrotic; the marginal part was calcareous and commencing at one point to separate from the very dense capsule which surrounded it.

The Right Prepectoral Gland, the size of a large shot, was similar in structure.

The Left Prescapular and Axillary Glands were normal.

Thorax.

Pleura.—Normal.

Lungs.—The surface of the lung revealed on close inspection a moderate number of small grey tubercles with opaque centres. These on the whole were rather larger than one commonly sees in calves injected with viruses of Group II. They readily shelled out on the point of a knife, and the largest were then seen to be about the size of mustard seeds. They were slightly calcareous. Twenty-three were counted on the surface of the right lung, and there were probably a similar number in the left.

The Bronchial and other Thoracic Glands.—The left bronchial contained a single calcareous focus. The other thoracic glands were normal.

Heart.—Normal.

Alimentary Tract.

Tongue, Pharynx, Palate, Tonsils.—Normal.

Intestines.—There was a yellow focus in one of the Peyer's patches of the small intestine, in which tubercle bacilli were found. The large intestine was normal.

Mesenteric Glands.—Normal.

Abdomen.

Peritoneum.—Normal.

Spleen.—Normal.

Liver.—Normal.

Portal Glands.—Normal.

Kidneys.—Normal.

Suprarenals.—In the cortex of the left was a single tubercle similar in size to those in the lungs.

Renal, Lumbar, and Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Various Lymphatic Glands.

Precrural and Popliteal, Gluteal and Ischiatic, Pubic, Posterior-Pharyngeal and Hyoid, Submaxillary and Subparotid.—Normal.

Microscopical Examination.

Tubercle from Lung.—Three tubercle bacilli seen.

Yellow focus from small Intestine.—Tubercle bacilli.

Focus from Bronchial Gland.—No tubercle bacilli seen.

CALF 1031. (Virus H 61. "E.C.")

Subcutaneous Inoculation of culture derived from human brain, through Guinea-Pig 1837.

Dose—50 milligrammes.

Date—April 9th, 1906.

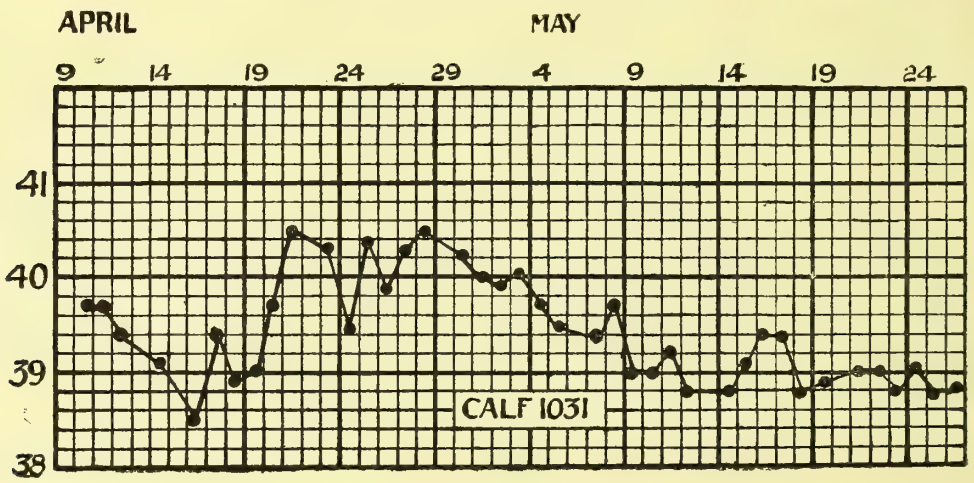
Weight at Inoculation—3 qrs. 18 lbs.

Killed—July 10th, 1906. [92 days after inoculation.]

Clinical Notes.

The calf was inoculated on April 9th, 1906. Except for some slight constitutional disturbance shortly after the inoculation, it remained in good health during the period of the experiment. It was killed on July 10th, 1906, 92 days after inoculation.

Temperature.



From May 28th to July 10th, when the calf was killed, the temperature remained normal.

Weights.

	cwt.	qrs.	lbs.
April 9th, 1906 - - - -	0	3	18
July 10th, 1906 - - - -	1	1	1

Total gain of weight during experiment.—1 qr. 11 lbs.

Average rate of gain per week.—3 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General condition.—Good.

At the Seat of Inoculation.—On the right side of the neck, was a small prominent and fluctuating swelling, 2½ in. by 2 in. by 1¼ in., weighing 2 ozs. It was composed of soft caseous tissue surrounded by dense fibrous tissue, the lining of which was infiltrated by calcareous grains.

The Right Prescapular Gland was slightly enlarged. About half of it was composed of a fibro-calcareous nodule which was softening peripherally.

The Prepectoral Gland.—The size of a small pea, was fibro-calcareous throughout.

Left Prescapular and Axillary Glands.—Normal.

Pleura.—Normal.

Lungs.—Normal, except that the right anterior lobe was carnified.

Thoracic Glands.—Normal.

Heart.—Normal.

Tongue, Pharynx, Palate, Tonsils.—Normal.

Larynx and Trachœa.—Normal.

Intestines.—Normal.

Mesenteric Glands.—Normal.

Omentum and Peritoneum.—Normal.

Spleen.—Normal.

Liver.—Normal.

Portal Glands.—Normal.

Kidneys.—Normal.

Suprarenals.—Normal.

Lumbar, Renal, and Iliac Glands.—Normal.

Testes—.Normal.

Eyes.—Normal.

Various Lymphatic Glands.

Precrural and Popliteal.—Normal.

Gluteal and Ischiatic.—Normal.

Pubic.—Normal.

Posterior-Pharyngeal and Hyoid.—Normal.

Submaxillary and Subparotid.—Normal.

MONKEY 73. (Virus H 91. "E.C.")

Subcutaneous Inoculation of culture derived from human brain, through Guinea-Pig 1837.

Dose—0·01 milligramme.

Date—April 9th, 1906.

Died—July 7th, 1906. [89 days after inoculation.]

Weight at Death—2,560 grammes.

Clinical Notes.

The monkey was inoculated on April 9th, 1906. After inoculation an ulcer appeared between the shoulders, and swellings appeared in the anterior axillary fold just outside the nipples on each side; these increased in size, and subsequently discharged. The animal became thin and ill about the middle of the third month, and died on July 7th, 89 days after inoculation.

Temperature.

Not recorded.

POST-MORTEM EXAMINATION.

General Condition.—Emaciated.

At the Seat of Injection between the shoulders was a dry shallow ulcer measuring 3 in. by $1\frac{3}{4}$ in. The floor was composed of scar tissue, and could be dissected free from the subjacent muscle, which was not affected except just at the centre of the ulcer where it was adherent to its floor.

In the Anterior Axillary Fold on each side of the body, just above the level of the nipple and about 1 in. exterior to it, was a tuberculous ulcer.

On the right side, about $1\frac{1}{2}$ in. lower down in the mid-axillary line, was another tuberculous ulcer.

Corresponding with the ulcer on the left side was a mass of caseous and softened glands, $\frac{1}{4}$ in. in length. Deeper in the axilla, around the vessels and nerves, were several small caseous glands the size of shot.

On the right side the mass of soft and caseous glands was larger, and measured 2 in. in length.

The lower of the two ulcers on this side was entirely cutaneous, and corresponded to no lymphatic glands It was probably the result of a bite or accidental wound.

The Inguinal Glands were swollen and red, and on the left side contained caseous foci. On the right side they appeared to be free from tuberculosis.

Thorax.

On each side of the Spinal Column there were two large hemispherical caseous masses, over $\frac{5}{8}$in. in diameter, projecting into the thoracic cavity. These corresponded in situation to the ulcer at the seat of inoculation, but the lesions were not continuous, and those in the pleura probably originated in the glands between the heads of the ribs. There were two or three little tubercles scattered over other parts of the *costal pleura.*

Lungs.—On the surface of each lung there were a moderate number of small tubercles (probably less than 50 on each), a few of which were $\frac{1}{8}$ in. or $\frac{1}{6}$ in. in diameter There were two small areas of consolidation; the rest of the lungs were rather distended with air.

Between the finger and thumb some tubercles could be felt in the substance of the organ, and these when cut into were found to be larger than those on the surface *i.e.*, about $\frac{1}{8}$ in. in diameter, softened in their interior.

The Bronchial Glands were enlarged, caseous, and softened. Three were as big as peas.

A Post-sternal Gland was found to be caseous.

The Heart was normal.

Abdomen.

Omentum and Peritoneum.—There were a few small caseous tubercles on the omentum. (*See under* "Mesentery" *infra.*)

The Spleen was greatly enlarged, $2\frac{3}{4}$ in. in length. Projecting from every part of the surface were cream coloured tubercles varying in size, some being as big as a large pea. These were so numerous that there was only a little purple tissue seen between them. Section showed that the spleen was almost entirely made up of confluent tuberculous masses, composed of softened caseous material.

Liver.—On the upper surface of the liver about a dozen small yellow tubercles were seen, and about half that number on the under surface; the larger ones, which projected slightly from the surface, being about $\frac{1}{6}$ in. in diameter. They were all caseous and commencing to soften at their centres.

Kidneys.—Each kidney contained numerous small caseous tubercles, sometimes confluent and collected into groups. Section showed them scattered throughout the cortex, but only one was found in the medulla.

The Suprarenals were normal.

A Lumbar Gland was found to be caseous.

Alimentary Tract.

The Tongue was normal. There was a single small tubercle seen in the mucous membrane at the opening of one of the buccal pouches.

Palate.—There was a little tuberculous focus on the upper part of the palate.

Tonsils.—There were some small foci in each tonsil.

Both Submaxillary, Right Subparotid, and both Posterior-Pharnygeal Lymphatic Glands contained caseous foci. They were not, however, severely affected.

The Thymus and Thyroid Glands.—Both contained tubercles.

The Larynx and Trachea were normal.

The Œsophagus was normal.

Stomach.—There were three firm tubercles in the fringes of the stomach.

Intestines.—There were very numerous tuberculous nodules about $\frac{1}{6}$ in. to $\frac{1}{4}$ in. or even more in diameter, in the small intestine. These projected into the gut, and were slightly ulcerated in the centres. Towards the lower end of the small intestine these nodules tended to become confluent, forming elongated patches, parallel to the long axis of the gut. In these the ulceration was more advanced.

The cæcum and commencement of the large intestine contained very numerous small superficial ulcers. These became less numerous further on, and the terminal part of the colon and the rectum were normal.

The Mesentery corresponding to the part of the intestine where the ulceration was most marked was studded with small tubercles arranged along the lymphatics.

The Mesenteric Glands formed a large irregular nodular mass which measured $2\frac{3}{4}$ in. by $1\frac{3}{4}$ in., and which was nearly 1 in. in thickness. All the glands were caseous and softened, and besides these there were a good many caseous glands about the cæcum.

Genito-Urinary System.

Testes.—On the right side there was a caseous nodule in the epididymus, and one about the size of a small shot in the spermatic cord. The left testis was normal.

Eyes.—Normal.

Muscles.—There were a good many tubercles in the muscles of the leg, gastrocnemius and adductor magnus, and those on the front of the shin.

A few tubercles were also seen in the muscles of the arms.

Skull and Brain.—Under the periosteum of the cranium were five caseous abscesses, two symmetrically situated just above the superciliary ridges, one on the vertex, and one over the left occipito-parietal suture. Each of these had perforated the skull, and communicated with a little caseous collection between the dura mater and the bone. The surface of the brain was congested, but there were no tubercles visible.

The Popliteal Glands were normal.

Microscopical Examination.

Pus from Abscess on Cranium.—Swarming with tubercle bacilli.

Caseous matter from Inside of Skull.—Numerous tubercle bacilli, no other organisms seen.

MONKEY 75 (Virus H 61. "E.C.")

Subcutaneous Inoculation of culture derived from human brain, through Guinea-Pig 1837.

Dose—0·1 milligramme.

Date—April 9th, 1906.

Died—July 2nd, 1906. [84 days after inoculation.]

Weight at Death—1,800 grammes.

Clinical Notes.

The monkey was inoculated on April 9th, 1906.

After inoculation an ulcer appeared between the shoulders, and the glands along the anterior axillary fold just outside the nipples became enlarged. The animal became thin and ill. It was found dead on July 2nd, 84 days after inoculation.

Temperature.

Not recorded.

POST-MORTEM EXAMINATION.

General Condition.—Thin.

At the Seat of Inoculation between the shoulders was a dry and shallow ulcer, which judging from the state of the fur around seems to have yielded very little discharge. The floor of the ulcer, which was composed of the superficial muscles, consisted of caseous nodules, and there was a large soft caseous mass $\frac{3}{4}$ in. in diameter in the superficial muscles a little to the right of the ulcer. The superficial muscles were quite free from the deeper ones, and the latter were not affected.

In each Axilla was a bunch of lymphatic glands $1\frac{1}{2}$ in. in length, the largest on each side being almost as big as a thrush's egg. They were entirely caseous and softened.

Thorax.

On removal of the thoracic organs a large nodular caseous growth could be seen on either side of the spine encroaching on the thoracic cavity.

On the left side were two hemispherical nodules close together, each of them about $\frac{1}{2}$ in. in diameter. On the right side there were four hemispherical nodules which varied from $\frac{1}{4}$ in. to over $\frac{1}{2}$ in. in diameter. These nodules corresponded in position to the ulcer at the seat of inoculation, but they were not directly in continuity with it, and had probably originated in the lymphatic glands which lie between the heads of the ribs.

The Lungs showed a small number of caseous tubercles on their surfaces, some of them $\frac{1}{8}$ in. or $\frac{1}{6}$ in. in diameter. On section tubercles were more numerous and larger, some of them being $\frac{1}{6}$ in. or even $\frac{1}{4}$ in. in diameter, but on the whole, the lungs were hardly so severely affected as the liver, and much less so than the spleen.

The Pleura was normal, except where a lung tubercle was adherent to it, and excepting also the caseous masses already described.

The Bronchial Glands were caseous.

Heart.—Normal.

Alimentary Tract.

Tongue, Pharynx, and Larynx.—Normal

There was a small caseous *Sublingual Lymphatic Gland*, but the *Submaxillary and Posterior-Pharyngeal Glands* appeared to be normal.

The Small Intestine was normal. *The Caecum* contained numerous small tuberculous ulcers. A few similar ulcers were seen in other parts of the *Large Intestine.*

The Mesenteric Glands were very much enlarged, soft and caseous. They formed an almost continuous mass $1\frac{1}{2}$ in. in length.

The glands in the margin of the meso-colon, and the coeliac glands, were also caseous.

Abdomen.

On opening the abdomen the omentum was loosely adherent to the abdominal wall. It was very vascular, and was thickly peppered with innumerable very minute tuberculous foci.

There were a few tubercles on the parietal peritoneum and some on the diaphragm.

There was a caseous adhesion between a large tubercle on the surface of the liver and the abdominal wall.

The liver was generally adherent to the diaphragm by loose adhesions, and at many points by former caseous adhesions, where a tubercle on the surface of the liver corresponded to one on the diaphragm.

The omentum was tightly adherent to tubercles on the surface of the spleen.

There was considerable excess of fluid in the abdominal cavity.

The Liver was covered with a thin layer of plastic lymph, which caused it to adhere to the diaphragm. On its surface were fairly numerous yellow tubercles, each of them $\frac{1}{8}$ in. or rather more in diameter, and one larger caseous tubercle about $\frac{1}{2}$ in. in diameter.

Section showed numerous caseous tubercles rather larger than those seen on the surface and having softened centres, scattered throughout the organ.

The Portal Glands were not seen.

Pancreas.—Appeared to be normal.

The Spleen was enlarged, and was adherent to the omentum and abdominal wall, to the latter by means of a continuous caseous growth.

It was packed so full of caseous tubercles as to be almost entirely composed of them, but their outlines were more or less distinct though they were pressed closely together. They were for the most part about $\frac{1}{6}$ in. in diameter, and they were softened in the centre.

Kidneys.—On the surface of each kidney were 8 or 9 small yellow tubercles, a few of the larger being about $\frac{1}{8}$ in. in diameter.

Suprarenals.—Normal.

Genito-Urinary System.

The Testes were adherent to the tunica vaginalis by means of caseous tubercles, and in the right was a large caseous nodule.

Meninges of Brain.—Normal.

Inguinal Glands.—Normal.

MONKEY 77. (Virus H 61. "E.C.")

Subcutaneous Inoculation of culture derived from human brain, through Guinea-pig 1837.

Dose—1·0 milligramme.

Date—April 9th, 1906.

Died—July 31st, 1906. [113 days after inoculation.]

Weight at Death—2,150 grammes.

Clinical Notes.

The monkey was inoculated on April 9th, 1906. After inoculation an ulcer appeared between the shoulders, and the glands along the anterior axillary fold just outside the nipples became visibly enlarged. These increased in size, and the one on the right ulcerated and discharged. The animal became thin and pale, and had a slight cough, but remained active until nearly the end. It was found dead on July 31st, 1906, 113 days after inoculation.

Temperature.

Not recorded.

POST-MORTEM EXAMINATION.

General Condition.—Thin.

At the Seat of Injection between the shoulders was an ulcer 3½ in. by 1½ in. thickly covered by dry warty crusts. Just outside the left nipple was a swelling. On cutting into this a cavity was found, ¾ in. in diameter, containing caseous pus, and lined with caseous debris. Similarly situated on the right side was a smaller swelling, surmounted by a scab. On cutting into the swelling it was found to be caseous.

Thorax.

On the back of the thorax and projecting into its cavity was a large nodular caseous tumour, 2 in. or more in length, and 2 in. in width. It lay chiefly on the left of the vertebral column, but a portion lay to the right, connected with the rest by a narrow bridge. The tumour was caseous and internally softened.

The left part of the tumour was incorporated with the lung.

The Lungs were voluminous. The right lower lobe was almost entirely consolidated by a large mass chiefly consisting of a ramifying solid caseous network with a small amount of fibrous tissue in its meshes. The two anterior or upper lobes on this side, and the whole of the left lung, contained scattered solid caseous nodules about ¼ in. in diameter. The dorsal portion of the left lower lobe, where it was not incorporated with the tumour in the thoracic wall, was collapsed by the pressure of the latter.

The Bronchial Glands were enlarged, caseous and softened.

The Costal Pleura, except for the tumour already mentioned, was normal.

The Heart was normal.

The Larynx and Trachœa, and Thyroid were normal.

Alimentary Tract.

The Tongue and Pharynx was normal.

There was a small caseous or pultaceous spot in one *Tonsil.*

A Retropharyngeal Gland was slightly enlarged and caseous.

A Cervical Gland lying just behind the top part of the manubrium was caseous.

The Small Intestine contained numerous circular tuberculous patches, some of which were superficially ulcerated.

The Large Intestine, including the cæcum, was riddled with little irregular ulcers, some of which had a central slough adhering to their floor.

The Cœliac Glands formed a nodular mass 1¼ in. by 1¼ in. *The Glands of the Mesentery* formed a mass 2½ in. by 1½ in. Both these masses were caseous and partly softened.

Besides this in the mesentery were nine or ten isolated glands as large as peas, some larger.

Along the greater length of the large intestine was a chain of pea-sized caseous glands lying very close to the gut.

Abdomen.

The Omentum contained a few small tubercles.

The Spleen was enlarged (it measured 2 in. by 1¼ in.) and nodular. It was almost entirely caseous, a few small angular areas of purple substance alone appearing between the nodules. The latter were partly softened.

The Liver contained about fifteen projecting tubercles mostly of large size. About half of these were nearly ½ in. in diameter. They were spherical thin-walled cysts, with caseous contents liquefied and often bile-stained.

Kidneys.—Each contained one or two small tubercles.

The Suprarenals appeared to be large, but were free from tubercles.

Eyes.—On the upper margin of the left orbit was a caseous and softened nodule penetrating some distance into the orbit and extending on to the forehead. It lay over bare bone.

A similar nodule was situated close by in the middle line.

Muscles.—There was a small tubercle in the right temporal muscle; a large multiple solid caseous nodule in the left adductor magnus and another in the anterior muscles of the right leg.

The Lower Jaw.—On the right side was a tuberculous abscess lying attached to the periosteum just over the foramen for the branch of the inferior maxillary nerve.

Between the Skull and the Dura Mater were several small collections of soft caseous matter, and the corresponding part of the inner table was ulcerated.

The Right Popliteal Gland was enlarged and caseous.

Microscopical Examination.

Caseous Patch on Dura Mater (two films examined).—No organisms other than tubercle bacilli.

VIRUS H 62. "W.M."

SPUTUM.

VIRUS H 62. "W.M."

CULTURE INOCULATION.

April 10, 1906.

Strain derived from human sputum, through Guinea-Pig 1786.

Total duration of artificial cultivation, 3½ months.

The 5th culture was used for injection, 21 days old, on pure bovine serum.



BULL-CALF 1019.

Subcutaneous.

Dose: 50 mg.

Killed, July 10, 1906.

91 days.

Small local lesion. Caseous tubercles in nearest glands. (L.T.)

RABBITS.

850	1 mg.	Killed 91 days	Trace of tuberculosis in peritoneum only.
851	1 „	„ 91 „	„ „



BULL-CALF 1069.

Subcutaneous.

Dose: 50 mg.

Killed, July 10, 1906.

91 days.

Small local lesion. Fibro-caseous nodule in prescapular gland. Three or four small tubercles in lung. (S.T.)

VIRUS H 62. "W.M."

W. M.," Female, aged 82.

Family History.—Not recorded.

Clinical History.—The patient's illness began after bronchitis six weeks before the sputum from her case was received at Blythwood.

There were some physical signs of disease at the apex of the left lung. The progress of the disease was rapid, and she died of phthisis within one year of the first onset of any symptoms. Two years before she died one of her servants had died of phthisis in the same house.

DESCRIPTION OF MATERIAL RECEIVED AT BLYTHWOOD, NOVEMBER 25th, 1906.

About 8 ozs. of tenacious sputum with small yellow masses in it. On microscopic examination many tubercle bacilli were found. They were seen to be aggregated together into masses, sharply defined, the bacilli being so closely packed in these masses as to be uncountable. Individual bacilli appeared to be much shorter than the tubercle bacilli usually found in the sputum.

Note.—The reason for investigating this virus was the unusual appearance of the bacilli, their extreme shortness suggesting that they might have been of bovine origin. The result, however, of the investigation of the virulence of this virus proved it to belong to Group II. Compact groups of large numbers of bacilli in the sputum resembled the appearance of young colonies from artificial cultures. and their shortness also corresponded to that of bacilli grown outside the body. It is probable that the peculiar appearance of the bacilli was due to their development in sputum which had been retained for a longer period than usual.

CALF 1019. (Virus H 62. "W.M.")

Subcutaneous Inoculation of culture derived from sputum through Guinea-Pig 1786.

Dose—50 milligrammes.

Date—April 10th, 1906.

Weight at Inoculation—3 qrs. 19 lbs. (Age about 8 weeks.)

Killed—July 10th, 1906. [91 days after inoculation.]

Clinical Notes.

The calf was inoculated on April 10th, 1906. The development of the tumour at the seat of inoculation and of the neighbouring prescapluar gland was similar to that usually seen in calves inoculated with viruses of Group II. The animal remained in good health and was killed on July 10th, 1906, 91 days after inoculation.

Temperature.

The temperature rose to 40·0° C. on the 12th day after inoculation, but soon fell, and remained normal until the close of the experiment.

Weights.

	cwt.	qrs.	lbs.
April 10th, 1906 - - - -	0	3	19
July 10th, 1906 - - - -	1	1	18

Total gain of weight during experiment.—1 qr. 27 lbs.

Average gain of weight per week.—4·2 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a crust covering a short sinus, leading into a small patch of dense fibrous tissue lined with a few calcareous grains.

Right Prescapular Gland.—Was not enlarged. It contained two little pea-sized caseous nodules.

Left Prescapular Gland.—Normal.

Prepectoral Glands.—The right prepectoral gland was quite small, and contained a few caseous grains. The left was normal,

Axillary Glands.—Normal.

Thorax.

Pleura, Lungs, Trachea, Thoracic Glands, Heart.—Normal.

Abdomen.

Peritoneum, Omentum, Intestines, Mesenteric Glands.—Normal.

Spleen.—Normal.

Liver.—One small white cyst seen on the surface. No tubercles seen.

Portal Glands, Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal, Submaxillary, Subparotid, Post-Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx, Larynx.—Normal.

Eyes.—Normal.

Microscopical Examination.

Contents of Cyst from Liver.—No tubercle bacilli.

CALF 1069. (Virus H 62. "W.M.")

Subcutaneous Inoculation of culture derived from sputum through Guinea-Pig 1786.

Dose—50 milligrammes.

Date—April 10th, 1906.

Weight at Inoculation—3 qrs. 16 lbs. (Age about 8 weeks.)

Killed—July 10th, 1906. [91 days after inoculation.]

Clinical Notes.

The calf was inoculated on April 10th, 1906. The development of the tumour at the seat of inoculation, and of the neighbouring prescapular gland, was similar to that usually seen in calves inoculated with viruses of Group II. The animal remained in good health, and was killed on July 10th, 1906, 91 days after inoculation.

Temperature.

The temperature was a little irregular during the first four weeks, after which it remained normal until the calf was killed.

Weights.

	cwt.	qrs.	lbs.
April 10th, 1906 - - - - -	0	3	16
July 10th, 1906 - - - - -	1	0	25

Total gain of weight during experiment.—1 qr. 9 lbs.

Average rate of gain per week.—2·8 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a little opening in the thickened skin, lined with a small amount of softened caseous matter with calcareous grains.

Right Prescapular Gland.—Was not enlarged. It contained a soft pink fibrous nodule three quarters of an inch in diameter, in which were caseous grains.

Left Prescapular Gland, Prepectoral Glands, Axillary Glands.—Normal.

Thorax.

Pleura.—Normal.

Lungs.—In the posterior lobe of the right lung there were three or four little solid bodies about one millimetre in diameter. These differed from the usual retrogressive tubercles in being distinctly red, their margins being hyperæmic.

Trachea, Thoracic Glands, Heart.—Normal.

Abdomen.

Peritoneum, Omentum, Intestines, Mesenteric Glands, Spleen, Liver, Portal Glands, Kidneys, Suprarenals, Renal Glands, Lumbar Glands, Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal, Submaxillary, Subparotid, Pharyngeal, Hyoid.—Normal.

Tongue, Palate, Tonsils, Pharynx, Larynx.—Normal.

Eyes.—Normal.

Microscopical Examination.

Tubercle from Lung.—No tubercle bacilli seen.

VIRUS H 63. "G.R."

CERVICAL GLANDS, MESENTERIC GLANDS AND BRAIN. (Post-mortem.)

VIRUS H 63. "G.R."

CULTURE INOCULATIONS.

CERVICAL GLANDS.

May 3, 1906.

The strain was derived from human cervical glands, direct ;
It was raised on March 9, and had therefore been 8 weeks in cultivation.
The 3rd culture was used for injection, 21 days old, on pure bovine serum.



BULL-CALF 1047

Subcutaneous.
Dose : 50 mg.
Killed when in poor health : August 7, 1906.
96 days.
P.M. — Small local lesion. Caseo-calcareous nodules in prescapular gland. In the lungs were a good many little translucent tubercles. [**S.T.**]

PUP 13.

Intraperitoneal.
Dose : 10 mg.
Killed : July 27, 1906.
85 days.
P.M. — Fibro-caseous tuberculous nodules in abdominal wall, and another in the omentum. Numerous ittle ? tubercle in liver.

PUP 15.

Intraperitoneal.
Dose : 10 mg.
Died : June 20, 1906.
48 days.
P.M. — Acute tuberculous peritonitis ; general tuberculosis.

RABBITS.

869	10 mg.	D. 20 days	? progressive tuberculosis. Death from psorospermosis.
870	1· mg.	D. 34 „	Severe tuberculous peritonitis complicated by severe psorospermosis.
871	1· mg.	K. 96 „	Slight chronic tuberculosis of peritoneum and kidneys.

MESENTERIC GLANDS.

May 3, 1906.

The strain was derived from human mesenteric glands, direct ;
It was raised on March 9, and had therefore been 8 weeks in cultivation.
The 3rd culture was used for injection, 21 days old, on pure bovine serum.

RABBITS.

872	1· mg.	D. 35 days	Tuberculous peritonitis. Death due to psorospermosis.
873	1· mg.	K. 96 „	Slight chronic tuberculosis of peritoneum and kidneys.



BULL-CALF 1021.

Subcutaneous.
Dose : 47·5 mg.
Killed : August 7, 1906.
96 days.
P.M. — Small local lesion. Prescapular gland caseo-necrotic and partly calcareous ; prepectoral gland similar. [**L.T.**]

BRAIN.

May 14, 1906.

The strain was derived from human brain, through Guinea-pig 1877 ;
It was raised on April 3, and had therefore been 6 weeks in cultivation.
The 2nd culture was used for injection, 21 days old, on pure bovine serum.

RABBITS.

875	10 mg.	D. 21 days	Acute infection.
876	1 mg.	K. 92 „	Chronic tuberculous peritonitis. Trace in kidneys.



BULL-CALF 1073.

Subcutaneous.
Dose : 100 mg.
Killed : August 13, 1906.
91 days.
P.M. — Small local lesion. Dense necrotic nodules in nearest glands. One tubercle in suprarenal. [**S.T.**

VIRUS H 63. "G.R."

G.R., a Female Child, aged Seven Months, Admitted to Hospital on February 12th, 1906, Suffering from Congenital Heart Disease. Died March 7th, 1906.

Family History.—The child was the youngest of seven, two of whom died of "consumption of the bowels," and one of convulsions. Maternal grandfather died of phthisis.

Clinical History.—The child had been bottle-fed from birth. She had suffered all her life from diarrhœa, and since the age of five weeks had been wasting, and had been under treatment as an out-patient.

On admission she was pale and emaciated. There was no cyanosis. The heart was enlarged, and a loud systolic murmur could be heard. There were signs of bronchitis all over the pulmonary area. There were enlarged glands in the neck, and the spleen could be distinctly felt.

No improvement took place in the child's condition, and she died about three weeks after admission.

POST-MORTEM EXAMINATION.

There were no scars in the neck.

Cervical Glands.—Were enlarged.

Thorax.

Pleuræ.—Both pleuræ were adherent to the thoracic wall.

Lungs.—Both lungs were infiltrated with tubercles, especially the left. In one of the lobes of the right lung the tubercles were commencing to caseate.

Bronchial Glands.—Enlarged and caseating.

Abdomen.

Peritoneum.—Normal.

Intestines.—Extensively ulcerated.

Mesenteric Glands.—Enlarged and caseating.

Liver.—Showed numerous tubercles, both on the surface and on section.

Spleen.—Showed numerous tubercles, both on the surface and in the substance of the organ.

Kidneys.—Many tubercles on the surface, beneath the capsule

Brain and Meninges.—There was tuberculous meningitis over the region of the left sylvian fissure. There was a caseous patch in the cerebellum, and one caseous nodule was seen on the floor of the fourth ventricle.

DESCRIPTION OF MATERIAL RECEIVED AT BLYTHWOOD.

Mesenteric Glands.—The mesenteric glands received were about the size of peas, cream-coloured and caseous not softened, b eaking down rather easily when scraped.

Cervical Glands.—Similar in appearance to the mesenteric.

Spleen.—A small portion of the spleen was received in which one tubercle could be seen.

Liver and Kidneys.—Small pieces of these organs were received, but no tubercles could be seen in them.

Brain.—Small portions of the brain and cerebellum were received. These showed evidence of tubercle. A small piece of meninges accompanying them contained many small granules.

Microscopical Examination.

Emulsion of Meninges.—Tubercle bacilli numerous, long, and beaded in form.

Tubercle from Brain.—No tubercle bacilli seen.

Tubercle from Spleen.—One tubercle bacillus seen.

Scraping from Cervical Gland.—Tubercle bacilli numerous, long and beaded.

Scraping from Mesenteric Gland.—Tubercle bacilli numerous, long and beaded.

CALF 1047. (Virus H 63. "G.R.")

Subcutaneous Inoculation of culture derived from human cervical glands.

Dose—50 milligrammes.

Date—May 3rd, 1906.

Weight at Inoculation—3 qrs. 5 lbs.

Killed—August 7th, 1906. [96 days after inoculation.]

Clinical Notes.

The calf was inoculated on May 3rd, 1906.

The constitutional disturbance frequently seen after injections of viruses of Group II. was in this case more severe and protracted than usual. The calf did not grow, and looked ill and thin when killed on August 7th, 96 days after injection.

Temperature.

The temperature, though irregular, was approximately normal throughout. There was no marked rise following the injection, and the highest temperature recorded during the period of the experiment was only 39·8°C.

Weights.

There was practically no increase of weight during the experiment.

	qrs.	lbs.
May 3rd, 1906 - - - - - - -	3	5
August 7th, 1906 - - - - - - -	3	9

Total gain of weight during experiment.—4 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Thin.

At the Seat of Inoculation.—On the right side of the neck was a small swelling with a central depression. Beneath was a group of calcareous foci set in dense fibrous tissue.

The Right Prescapular Gland.—Was a little enlarged, and contained two rounded caseo-calcareous nodules each as large as a large pea.

Prepectoral, Left Prescapular, and Axillary Glands.—Normal.

Thorax.

Pleura.—Normal.

The Lungs.—Contracted very well, but contained a good many little translucent tubercles in patches. They could easily be felt between the finger and thumb.

Thoracic Glands, Heart.—Normal.

Abdomen.

Omentum, Peritoneum, Spleen, Liver.—Normal.

Portal Glands.—Normal.

Kidneys.—Each kidney was pitted with rather numerous little depressions. There were no tubercles.

Suprarenals, Renal, Lumbar, and Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Alimentary Tract.

Tongue, Pharynx, Palate, Tonsils.—Normal.

Intestines.—Normal.

Mesenteric Glands.—Normal.

Various Lymphatic Glands.

Precrural and Popliteal, Gluteal and Ischiatic, Pubic, Posterior-pharnygeal and Hyoid, Submaxillary and Subparotid.—Normal.

CALF 1021. (Virus H 63. "G.R.")

Subcutaneous Inoculation of culture derived from human mesenteric glands.

Dose—47·5 milligrammes.

Date—May 3rd, 1906.

Weight at Inoculation—3 qrs. 10 lbs.

Killed—August 7th, 1906. [96 days after inoculation.]

Clinical Notes.

The calf was inoculated on May 3rd, 1906. Unlike its fellow, No. 1047, this calf remained in good health and grew well. It was killed on August 7th, 96 days after inoculation.

Temperature.

There was a slight rise of temperature during the second and third weeks, the highest recorded being 40·0°C. on the 14th day. The temperature subsequently remained approximately normal until the calf was killed at the close of the third month after inoculation.

Weights.

	cwt.	qrs.	lbs.
May 3rd, 1906 - - - - - -	0	3	10
August 7th, 1906 - - - - - -	1	1	11

Total gain of weight during experiment.—2 qrs. 1 lb.
Average rate of gain per week.—4·2 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

At the Seat of Inoculation.—On the right side of the neck, was a swelling with a central depression closed by a scab, beneath which was a small sinus leading into a mass of fibrous tissue containing calcareous grains.

The Right Prescapular Gland.—Was moderately enlarged. It contained a large salmon-pink dense necrotic nodule, calcareous externally, and containing a small central cavity. The rest of the gland contained caseo-calcareous nodules.

The Prepectoral Gland.—As large as a pea, was similar in structure.

The Axillary and Left Prescapular Glands.—Were normal.

Thorax.

Pleura.—Normal.

Lungs.—The anterior lobe of the right lung was carnified. There was no sign of tuberculosis in the organ.

Thoracic Glands, Heart.—Normal.

Abdomen

Omentum, Peritoneum.—Normal.
Intestines, Mesenteric Glands.—Normal.
Spleen.—Normal.
Liver.—Normal.
Portal Glands.—Normal.
Kidneys.—Normal.
Suprarenals.—Normal.
Renal, Lumbar, and Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Various Lymphatic Glands

Precrural and Popliteal.—Normal.
Gluteal and Ischiatic.—Normal.
Pubic.—Normal.
Posterior-pharyngeal and Hyoid.—Normal.
Submaxillary and Subparotid.—Normal.

Tongue, Pharynx, Palate, Tonsils.—Normal.

CALF 1073. Virus H 63. "G.R.")

Subcutaneous Inoculation of culture derived from human brain through Guinea-Pig 1877.

Dose—100 milligrammes.

Date—May 14th, 1906.

Weight at Inoculation—3 qrs. 10 lbs.

Killed—August 13th, 1906. [91 days after inoculation.]

Clinical Notes.

The calf was inoculated on May 14th, 1906. It remained perfectly well, and grew rapidly. It was killed on August 13th, 1906, 91 days after inoculation.

Temperature.

There was a rise of temperature during the second and third weeks after inoculation, but after June 3rd. it remained approximately normal.

Weights.

	cwt.	qrs.	lbs.
May 14th, 1906 - - - - -	0	3	10
August 13th, 1906 - - - -	1	1	19

Total gain of weight during experiment.—2 qrs. 2 lbs.

Average rate of gain per week.—5 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

At the Seat of Inoculation.—On the right side of the neck, was a depression leading to a short sinus which contained a few cubic centimetres of creamy caseous matter. Around in the subcutaneous tissue was a dense mass of fibrous tissue which contained calcareous grains.

The Right Prescapular and Prepectoral Glands.—Were necrotic nodules, with calcareous grains in the pheripheral parts.

The Axillary and Left Prescapular Glands.—Were normal.

Thorax.

Pleura.—Normal.

Lungs.—Perfectly normal. Weight 1 lb. 12 ozs.

Thoracic Glands.—Normal.

Heart.—Normal.

Abdomen.

Omentum and Peritoneum.—Normal.

Intestines.—Normal.

Mesenteric Glands.—Normal.

Spleen, Liver, Portal Glands, Kidneys.—

Suprarenals.—The right contained a single small tubercle. Left normal.

Renal, Lumbar and Iliac Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Various Lymphatic Glands.

Precrural and Popliteal.—Normal.

Gluteal and Ischiatic.—Normal.

Pubic.—Normal.

Posterior-pharyngeal and Hyoid.—Normal.

Submaxillary and Subparotid.—Normal.

Tongue, Pharynx, Palate, Tonsils.—Normal.

Eyes.—Normal.

VIRUS H 64. "M.G."

MESENTERIC GLANDS AND MENINGES. (Post-mortem.)

VIRUS H 64. "M.G."

CULTURE INOCULATIONS.

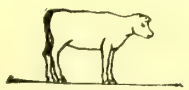
MESENTERIC GLANDS.

July 14, 1906.

Strain derived from human mesenteric glands, through Rabbit 806, and G.P. 1910.

Total duration of artificial cultivation : 2 months.

3rd subculture on pure serum used for injection, 18 days old.



BULL-CALF 1111.

Subcutaneous.

Dose : 10 mg.

Killed when dying : Sept. 12, 1906.

60 days.

General tuberculosis, severe.



BULL-CALF 1113.

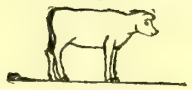
Subcutaneous.

Dose : 10 mg.

Killed when well : Oct. 8, 1906.

86 days.

General tuberculosis, slight.



BULL-CALF 1115.

Subcutaneous.

Dose : 50 mg.

Died : Aug. 21, 1906.

38 days.

General tuberculosis, severe.

RABBITS.

928	8 mg.	Died 91 days.	G.T. Injection partly intra-cæcal.
929	1· „	„ 25 „	G.T.
930	1· „	„ 21 „	„
931	0·1 „	„ 34 „	„

MENINGES.

June 2, 1906.

Strain derived from human meninges, through G.P. 1880.

Total duration of artificial cultivation : 2 months.

2nd. subculture on pure serum used, 21 days old.



BULL-CALF 1091.

Subcutaneous.

Dose : 45 mg.

Killed when dying : July 9, 1906.

37 days.

General tuberculosis, severe.

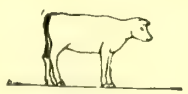
MENINGES.

August 16, 1906.

Strain derived from human meninges, through G.P. 1880.

Total duration of artificial cultivation : 4½ months.

3rd. subculture on pure serum used for injection, 21 days old.



COW-CALF 1105.

Subcutaneous.

Dose : 10 mg.

Killed when dying : Oct. 12, 1906. 57 days. General tuberculosis, severe.



BULL-CALF 1123.

Subcutaneous.

Dose : 10 mg.

Killed when in poor health: Nov. 1, 1906. 77 days. General tuberculosis, moderate.

RABBITS. [FED]†

941	10 mg.	Killed 53 days.	G.T.
942	10· „	„ 91 „	T. of alimentary tract, glands in connection with it, lungs, bronchial glands, kidneys.
943	1· „	„ 53 „	Slight G.T.
944	1· „	„ 91 „	As in 942.

† For full details of these feeding experiments. See pp. 1131 and 1144.

GUINEA-PIGS. [FED.]†

1953	1· mg.	Killed 51 days.	G.T. not severe.
1954	1· „	„ 61 „	G.T.
1955	1· „	„ 91 „	G.T.
1956	0·1 „	„ 51 „	Slight G.T.
1957	0·1 „	„ 61 „	Primary ulcer in colon. Secondary T. of intestinal glands, spleen, and portal glands (slight).
1958	0·1 „	„ 91 „	G.T.

VIRUS H 64. "M.G."

M.G., A Female Child aged four and three-quarter years, Admitted to Hospital on March 5th, 1906, Suffering from General Tuberculosis. Died on March 12th, 1906.

Family History.—The parents were alive and healthy, and there was no history of tuberculosis in the family.

Clinical History.—The child had been artificially fed from birth, condensed milk having formed one of the chief items of its diet. The child had been apparently well up to three months before admission. She then commenced to complain of occasional headaches, which during the last week of this period had been more marked, the pain in the forehead being great. With the increase of the headache the child had also suffered from vomiting several times during the day, and once during the night. There were also alternate periods of screaming and drowsiness. The bowels had not been opened for four days before admission. For some time the child had been noticed to be wasting.

Condition on Admission.—The child was well developed, and not thin. She was pale, but the cheeks and lips were cyanosed. The skin was warm and moist. The legs were flexed, and any attempt to straighten them was resisted. There was some incontinence of urine. There were no specially marked nervous symptoms. The reflexes were normal. There was no squint, but some ptosis was noted; the right eye appeared to be more sensitive to light than the left. The abdomen was soft. The liver could not be felt. The spleen was hard. The lungs and heart were normal.

Two days after admission the child was semi-conscious. There was an occasional squint; the head was not retracted. On ophthalmoscopic examination there was seen to be optic neuritis in both eyes, and tubercles were seen in both choroids.

Three days later the child had become more comatose, and twitching was noted. On the 12th of March, a week after admission, the squint and twitchings had become more marked. The temperature rose to 106°, and death took place.

POST-MORTEM EXAMINATION.

There were no scars in the neck.

Thorax.

Lungs.—Both lungs were thickly studded throughout with small tubercles.

Bronchial Glands.—Apparently normal.

Abdomen.

Peritoneum.—Normal.

Intestines.—Apparently healthy

Mesenteric Glands.—Were slightly larger than normal, and one was caseating.

Liver.—Showed a few superficial tubercles.

Spleen.—Showed a small number of tubercles on the surface.

Kidneys.—In both kidneys a large number of tubercles were seen beneath the capsule.

Meninges of Brain.—The meninges were studded all over with scattered tubercles. The tubercles were most numerous on the under surface of the brain.

DESCRIPTION OF MATERIAL RECEIVED AT BLYTHWOOD.

The Mesentery contained a fair amount of fat and several mesenteric glands, which on section showed nodules of caseous matter like soft dry putty, and very hard and dry calcareous grains. Two of the glands did not appear to be enlarged; the others were bigger than normal. One of the glands was apparently in an earlier stage of caseation than the rest.

A Portion of Spleen which was received showed a few little irregular translucent elevations, with well-defined margins, on the surface of the capsule. No tubercles were seen on section.

Half of one of the Kidneys was received, and showed numerous little pale spots on the surface, resembling miliary tubercles.

A Portion of Meninges, with Brain adherent, showed an occasional small tubercle.

A Portion of Lung, bright scarlet in colour, and air-containing, was closely packed with innumerable grey miliary tubercles.

Microscopical Examination.

Caseous Matter from Mesenteric Glands.—A few short tubercle bacilli were seen.

Emulsion of Meninges and Brain Matter.—Tubercle bacilli numerous, slender, rather long, inclined to be beaded.

Emulsion of Lung.—Tubercle bacilli very few in number, but similar in appearance to those in the meninges. Other micro-organisms were numerous.

CALF 1111. (Virus H 64. "M.G.")

Subcutaneous Inoculation of culture derived from human mesenteric glands through Rabbit 806, and Guinea Pig 1910.

Dose—10 milligrammes.

Date—July 14th, 1906.

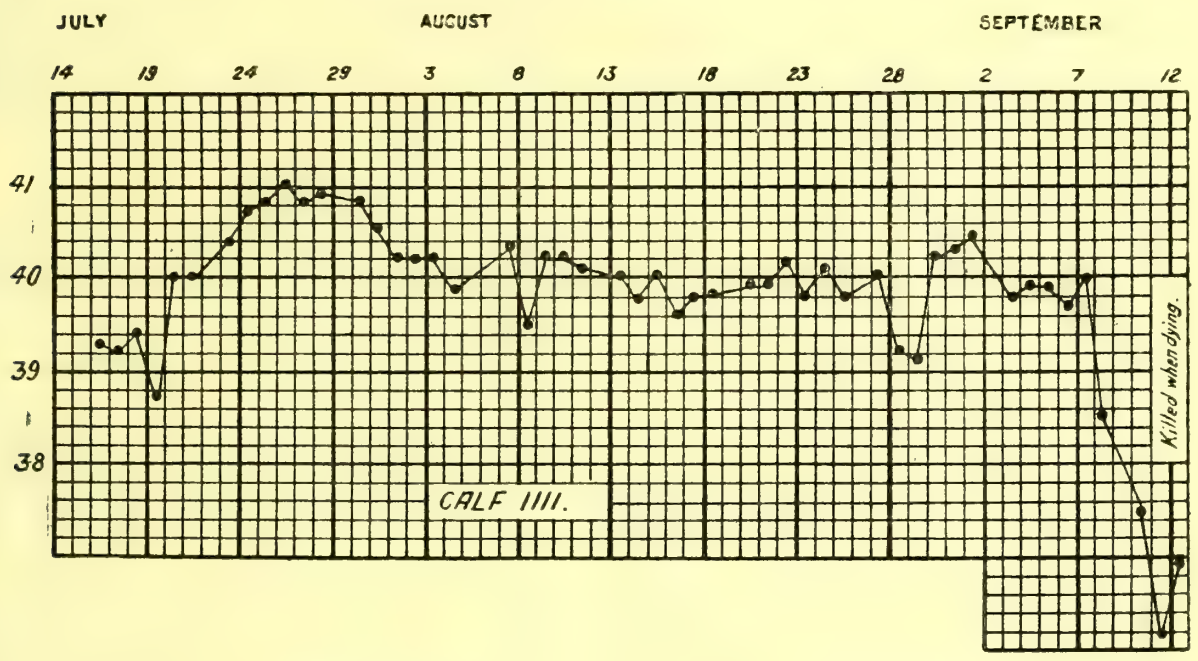
Weight at Inoculation—3 qrs. 24 lbs.

Killed—When dying, September 12th, 1906. [60 days after inoculation.]

Clinical Notes.

The calf was inoculated on July 14th, 1906. The temperature rose rapidly, reaching 41·0°C. on the 12th day. A large tumour developed at the seat of inoculation, and the prescapular gland became greatly enlarged. The animal slowly became ill, and grew very thin; and it was killed when in a dying condition on September 12th, 1906, 60 days after inoculation.

Temperature.



Weights.

	qrs.	lbs.
July 14th, 1906 - - - -	3	24
September 12th, 1906 - - -	3	6

Total loss of weight.—18 lbs.

Average rate of loss per week.—2·1 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Very thin.

At the Seat of Inoculation, on the right side of the neck, was a solid tumour, composed of dense yellowish white necrotic tissue with a ragged central cavity containing serum. The skin over it and the muscle beneath was infiltrated with caseous foci.

The tumour measured $5\frac{3}{4}$ in. by $4\frac{1}{4}$ in. by $2\frac{5}{8}$ in., and weighed 1 lb. 2 ozs.

The Right Prescapular Gland was enlarged, measuring $3\frac{1}{2}$ in. by 2 in. by $1\frac{3}{4}$ in., and weighing 4 ozs. It was caseo-necrotic throughout.

The Prepectoral (the size of a plum) and two *Pectoral Glands* were similar.

The Left Prescapular and Axillary Glands were packed with caseous tubercles.

Thorax.

The Pleura showed but little change.

The Lungs were closely studded on the surface with opaque grey tubercles, about $\frac{1}{8}$ in. in diameter, and largely confluent. The anterior parts were congested and airless; everywhere the organ was packed with tubercles, which in many places had become confluent, forming rectilinear caseous patches.

The Peribronchial Glands were enlarged and caseous.

The Bronchial and other Thoracic Glands were much enlarged and caseous.

The Heart was normal.

Abdomen

The Omentum contained a few small tubercles.

The Small Intestine contained about five tuberculous foci in the long Peyer's patch at the end of the ileum.

The Large Intestine was normal.

The Mesenteric Glands all contained pea-sized caseating nodules.

The Liver contained a moderate number of very small tubercles. It was not enlarged.

The Portal Glands were enlarged and caseous.

The Spleen was full of yellow tubercles. It was not enlarged.

The Kidneys showed a moderate number of small tubercles on their surfaces, and a few were seen on section.

The Suprarenals both contained a few tubercles.

The Renal, Lumbar, and Iliac Glands were packed with caseous tubercles.

Genito-Urinary System.

The Testes were normal.

In the Pharyngeal Mucous Membrane and in *both Tonsils* were some caseous tubercles.

Eyes.—Normal.

Various Lymphatic Glands.

Precrural and Popliteal, Gluteal and Ischiatic, Pubic, Posterior-Pharyngeal and Hyoid, Submaxillary and Subparotid.—All were packed with caseous tubercles.

CALF 1113. (Virus H 64. "M.G.")

Subcutaneous Inoculation of culture derived from human mesenteric glands, through Rabbit 806 and Guinea-Pig 1910.

Dose—10 milligrammes.

Date—July 14th, 1906.

Weight at Inoculation—3 qrs. 14 lbs.

Killed—October 8th, 1906. [86 days after inoculation.]

Clinical Notes.

The calf was inoculated on July 14th, 1906. A solid tumour of moderate size developed at the seat of inoculation, and the prescapular gland became considerably enlarged. The calf showed no signs of serious illness during the experiment, and was killed when quite well and in good condition on October 8th, 1906, 86 days after inoculation.

Temperature.

The temperature rose to 41·0°C. on the 9th day, but soon fell to 39·0°C. During the remaining period of the experiment it continued a little above the normal, the maximum range of variation being from 38·4°C. to 39·8°C.

Weights.

	cwt.	qrs.	lbs.
July 14th, 1906 - - -	0	3	14
October 8th, 1906 - - -	1	1	4

Total gain of weight during experiment.—1 qr. 18 lbs.

Average rate of gain per week—3·6 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Local Lesion.—At the site of inoculation, on the right side of the neck, was a firm tumour which measured 3 in. by 2 in. by 1⅓ in. On section it was composed of thickened skin and a dense yellow caseous mass ½ in. in greatest thickness, surrounded by a thick fibrous capsule, from which it was beginning to separate around the periphery. The skin was thickened, thoroughly adherent, and beset with light brownish translucent tubercles, most of which were calcareous in their centres.

Right Prescapular Gland.—Measured 2½ in. by 1¼ in. by 1¼ in. On section, with the exception of a narrow streak running down the centre, it was composed throughout of dense yellow caseo-necrotic substance, slightly gritty around the margins. The capsule was much thickened.

Prepectoral Glands.—The rounded prepectoral gland, the size of a pea, was dense and caseous throughout, and gritty around its margins. The reniform gland contained two greenish-yellow caseous nodules with fibrous margins, the largest the size of a pea.

The left prepectoral glands were enlarged, and contained a number of large caseous nodules, similar to those in the precrural glands (*see* below).

Axillary Glands.—The axillary glands were enlarged, and contained nodules similar to those found in the precrural glands (*see* below).

Cervical Glands.—The superior cervical glands contained a few softened greenish-yellow caseous nodules with fibrous capsules, up to 5 mm. in diameter. The other cervical glands were searched for, but were not found.

Thorax.

Pleura.—The parietal pleura showed altogether three small tubercles, loosely attached. The lymphatic fringes were not hypertrophied.

Lungs.—The lungs were crepitant throughout, and showed no areas of consolidation. On the surface there were a few somewhat flattened raised nodules with caseous slightly gritty centres and fibrous margins, the largest about 2·5 mm. in diameter. In the substance of the lung, under the pleura, were seen fairly numerous small tubercles, ranging in size from a mere point up to 2 mm. or rather more in diameter. On section similar tubercles were evenly distributed throughout the substance of the lung. They had yellow calcareous centres and grey translucent margins.

Trachea.—Normal.

Thoracic Glands.—The bronchial and dorsal mediastinal glands were only slightly enlarged. On section they showed in the cortices moderately numerous irregular caseo-calcareous tubercles, occurring singly, or aggregated loosely together to form caseo-calcareous patches. The ventral mediastinal glands were enlarged, and contained nodules similar to those found in the precrural glands (*see* below). The peribronchial glands were similarly affected.

Heart.—Normal.

Abdomen.

Peritoneum, Omentum.—Normal.

Intestines.—In the small intestine four Peyer's patches each showed two or three small congested pits. On section these were found to be situated over the centres of small caseous nodules.

The large intestine was normal.

Gastric Glands.—Contained discrete caseo-calcareous nodules.

Mesenteric Glands.—Were not enlarged. All showed in their cortices scattered caseo-calcareous nodules, which readily shelled out, and varied in size up to that of a hemp-seed. There were a few small caseo-calcareous patches, where the nodules had become aggregated together.

Ileo-Colic Glands.—Contained discrete caseo-calcareous nodules.

Spleen.—Contained moderately numerous spherical nodules, mostly about the size of a hemp-seed. The nodules were yellow, caseous, and distinctly gritty in the centre, and had translucent fibrous margins. Some of the nodules caused slight projections from the surface, and over these the capsule was a little congested.

Liver.—The liver showed, evenly distributed throughout its substance, rather numerous hard nodules, ranging in size from a pin's head to a good-sized hemp-seed. On section the nodules were caseous, perceptibly gritty, and had translucent fibrous capsules. Many of the larger subcapsular nodules projected prominently from the surface.

Gall Bladder.—Normal.

The Portal Glands were enlarged and closely beset with irregular yellow caseous tubercles, for the most part discrete, but here and there aggregated together. All the tubercles were distinctly gritty from calcification.

Kidneys.—The left kidney showed on the surface about half a dozen grey tubercles with opaque centres, ranging in size from a mere point up to about 1 mm. in diameter On section, one miliary caseous tubercle was found in the depth of the cortex

In the right kidney the tubercles were rather more numerous, and two or three, almost completely caseous ones, measured up to 2 mm. in diameter.

Suprarenal Bodies.—The right showed in the cortex a grey tubercle the size of a millet seed with a calcareous centre. There was a similar one in the left.

The Renal Glands were slightly enlarged, and closely beset with discrete miliary caseo-calcareous tubercles.

The Coeliac Glands resembled the portal.

Lumbar Glands, Iliac Glands.—Were enlarged, and contained nodules similar to those in the precrural glands (*see* below).

Genito-Urinary System.

Testicles.—Normal.

Special Glands.

Precrural.—Were distinctly enlarged, and contained numerous large nodules, ranging in size up to about one centimetre in diameter. They were composed of a greenish-yellow caseous substance, in the majority of cases softened, surrounded by a well-defined zone of fibrous tissue.

Gluteal, Popliteal.—Were also enlarged, and contained similar nodules.

Submaxillary.—Contained a few greenish-yellow caseous nodules up to 5 mm. in diameter.

Parotid.—Resembled the gluteal and popliteal.

Retropharyngeal.—Contained nodules similar to those in the submaxillary glands, and in addition a number of caseo-calcareous miliary tubercles.

Tongue, Tonsils, Pharynx, Larynx.—Normal.

Eyes.—Normal.

CALF 1115. (Virus H 64. "M.G.")

Subcutaneous Inoculation—of culture derived from human mesenteric glands, through Rabbit 806 and Guinea-pig 1910.

Dose—50 milligrammes.

Date—July 14th, 1906.

Weight at Inoculation—3 qrs. 10 lbs.

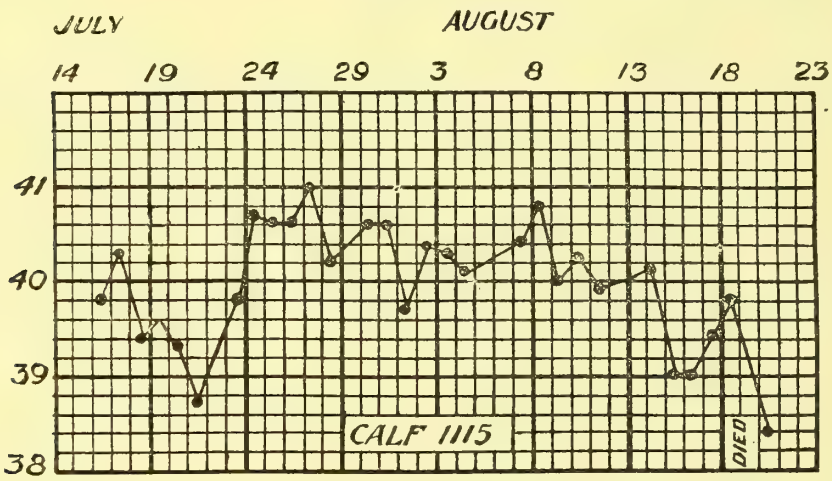
Died—August 21st, 1906. [38 days after inoculation.]

Clinical Notes.

The calf was inoculated on July 14th, 1906. The course of the disease was similar to that usually seen in calves suffering from acute tuberculosis.

The calf died on August 21st, 38 days after inoculation.

Temperature.



Weights.

	qrs.	lbs.
July 14th, 1906 - - - -	3	10
August 21st, 1906 - - -	2	24

Total loss of weight during experiment.—14 lbs.

Average rate of loss per week.—2·6 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Very thin.

At the Seat of Inoculation, on the right side of the neck, was a large tumour, measuring 6½ in. by 5½ in. by 2½ in., and weighing 1 lb. 14 ozs., cracked on the surface and covered with crusts.

It was composed of caseo-necrotic tissue, and had a small irregular central cavity. It infiltrated skin and subjacent muscle very widely; the infiltration of the latter extended to the opposite side of the neck.

The Right Prescapular Gland was much enlarged, and weighed 6 ozs. It was caseo-necrotic throughout.

The Left Prescapular was a little enlarged, and somewhat similar to the right but much softer.

The Right and Left Axillary Glands contained rather large caseating tubercles.

The Right Prepectoral Glands, three in number, were similar to the right prescapular.

The Right Hyoid (1¾ in. in diameter), and several deep *Cervical Glands* were enlarged, and similar to the right prescapular.

Thorax.

Pleura.—There were a few tubercles on the costal pleura.

The Lungs weighed 3 lbs. 11 ozs. They were studded moderately thickly with small opaque tubercles. Many of the little lobules, especially of the anterior lobes, were dark red and consolidated. On section small yellowish grey tubercles were numerous; yet the lungs were not very severely affected for so acute a case.

The Thoracic Glands were moderately enlarged and firm. Their cortices were formed of early caseo-necrotic tissue.

The Heart showed a single tubercle in the lining of the right auricle.

Abdomen.

Omentum and Peritoneum.—There were a few tubercles on the omentum.

Intestines—In the mucous membrane of the small intestine were a few caseous foci. The large intestine was normal.

The Mesenteric Glands contained rather large caseous tubercles, usually numerous, and in some cases confluent.

The Spleen was much enlarged, weighing 1 lb. 2 ozs., and was packed with large tubercles, all well over ⅛ in. and some ¼ in., in diameter. They were not very yellow, were less well-defined than usual, and had reddish margins.

The Liver was thickly studded with small raised tubercles, and in addition innumerable minute tubercles could be seen through the capsule. Only the larger tubercles were clearly visible on section.

The Portal Glands were enlarged, and packed with confluent tubercles.

The Kidneys showed a considerable number of tubercles in their cortices, and were soft and flabby.

The Suprarenals each contained two tubercles.

The Lumbar, Renal, and Iliac Glands contained rather large caseous tubercles, sometimes confluent.

The Tongue had a small tuberculous ulcer on its tip, and one on each side of the root.

There were numerous caseating tubercles in the *Tonsils* and *Pharynx.*

The Trachea was congested, and full of frothy mucus. It showed several tuberculous ulcers.

Testes.—The right contained a single small tubercle. The left was normal.

Eyes.—Normal.

Various Lymphatic Glands.

The following glands contained rather large caseous tubercles, usually numerous, and in some places confluent.

Precrural and Popliteal, Gluteal and Ischiatic, Pubic, Posterior-pharyngeal and left Hyoid, Submaxmillary and Subparotid.

Microscopical Examination.

Ulcer from Tongue.—Tubercle bacilli.

CALF 1091. (Virus H 64. "M.G.")

Subcutaneous Inoculation—of culture derived from human meninges through Guinea-pig 1880.

Dose—45 milligrammes.

Date—June 2nd, 1906.

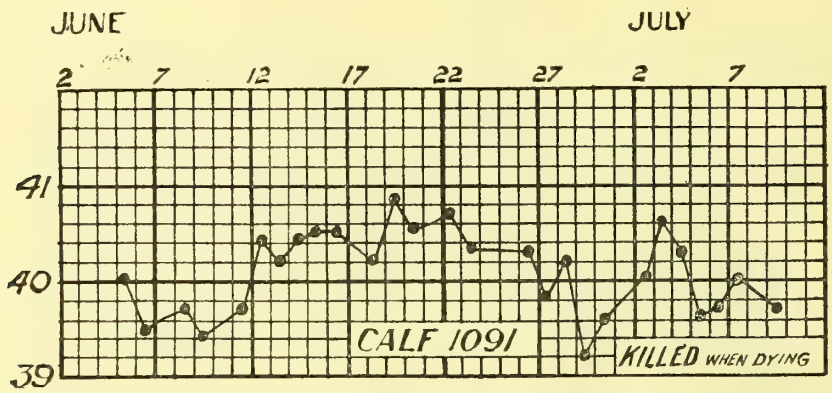
Weight at Inoculation—1 cwt. 0 qr. 0 lbs.

Killed—When dying, July 9th, 1906. [37 days after inoculation.]

Clinical Notes.

The calf was inoculated on June 2nd, 1906. The course of the disease was similar to that usually seen in calves inoculated with large doses of tubercle bacilli of Group I. The calf was killed when in a dying condition, 37 days after inoculation.

Temperature.



Weights.

The calf lost over one-sixth of its original weight during the experiment.

	cwt.	qrs.	lbs.
June 2nd, 1906 - - -	1	0	0
July 9th, 1906 - - -	0	3	8

Total loss of weight during experiment.—20 lbs.

Average rate of loss per week.—3·7 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Thin.

At the Seat of Inoculation, on the right side of the neck, was a large solid tumour which measured 5½ in. by 4 in. by 1½ in., and weighed 1lb. It was composed of dense fibro-necrotic tissue of a salmon-pink colour, with a small central cavity full of serous fluid, and the skin over it and the subjacent muscle were infiltrated with caseating tubercles.

The Right Prescapular Gland was much enlarged. It measured 4 in. by 2½ in. by 1¾ in. and weighed 6 ozs. About a third of it was composed of salmon-pink necrotic tissue, and the rest of a yellow caseating network with a small amount of translucent grey tissue in its meshes.

The Prepectoral Gland, 1 in. in diameter, was necrotic throughout.

The Axillary and Left Prescapular Glands were packed with grey tubercles with irregular yellow centres.

Thorax.

Pleura.—There were many tubercles on the costal pleura.

Lungs.—The anterior half of the lungs was solid, dark red, and thickly studded with grey tubercles, many of which were about ⅛ in. in diameter. On the posterior parts of the lungs tubercles could be dimly seen through the surface. Section showed that the lungs were crowded with little irregular yellowish tubercles with reddish-grey translucent margins.

The Thoracic Glands were enlarged, and their cortex was everywhere composed of confluent caseous tubercles with only a small amount of grey tissue between them.

The Heart was normal.

Abdomen.

Omentum and Peritoneum.—There were numerous tubercles of various sizes attached to the omentum and numerous tubercles on the peritoneal surface of the diaphragm.

Intestines.—Four small firm yellowish tubercles were seen in the ileum, and about half a dozen in the large intestine.

Mesenteric Glands.—These glands contained many tubercles and tuberculous nodules.

The Spleen was slightly enlarged, and closely packed with shot-sized tubercles, yellowish in colour, irregular in outline, and surrounded by a dense red zone.

Liver.—The surface was thickly studded with greyish-white tubercles slightly raised, many of them ⅛ in. in diameter, and some larger. The latter were loosely attached to the surface and many of them were as much as ¼ in. broad. Scattered throughout the liver were numerous small grey-whitish tubercles, most of which were about $\frac{1}{16}$ in. in diameter.

The Portal Glands were slightly enlarged, and resembled the thoracic.

Kidneys.—There were a moderate number of tubercles visible on the surface of each kidney, more numerous in the right, where about forty were counted. Some were visible on section in the cortex.

Suprarenals.—One or two small tubercles were seen in each.

Renal, Lumbar, and Iliac Glands were enlarged, and packed with grey tubercles with irregular yellow centres.

Eyes.—Normal.

Testes.—Normal.

Various Lymphatic Glands.

Precrural and Popliteal, Gluteal and Ischiatic, Pubic, Posterior-pharyngeal and Hyoid, Submaxillary and Sub-parotid.—All were packed with grey tubercles with irregular yellow centres.

Tongue.—Normal.

There were tubercles on the *corrugated mucous membrane of the Naso-pharynx* and in each *Tonsil.*

Larynx.—Normal.

Microscopic Examination.

Tubercle from Small Intestine.—Tubercle bacilli.

Tubercle from Large Intestine.—Tubercle bacilli.

CALF 1105. (Virus H 64 "M.G.")

Subcutaneous Inoculation of culture derived from human meninges, through Guinea-pig 1880.

Dose—10 milligrammes.

Date—August 16th, 1906.

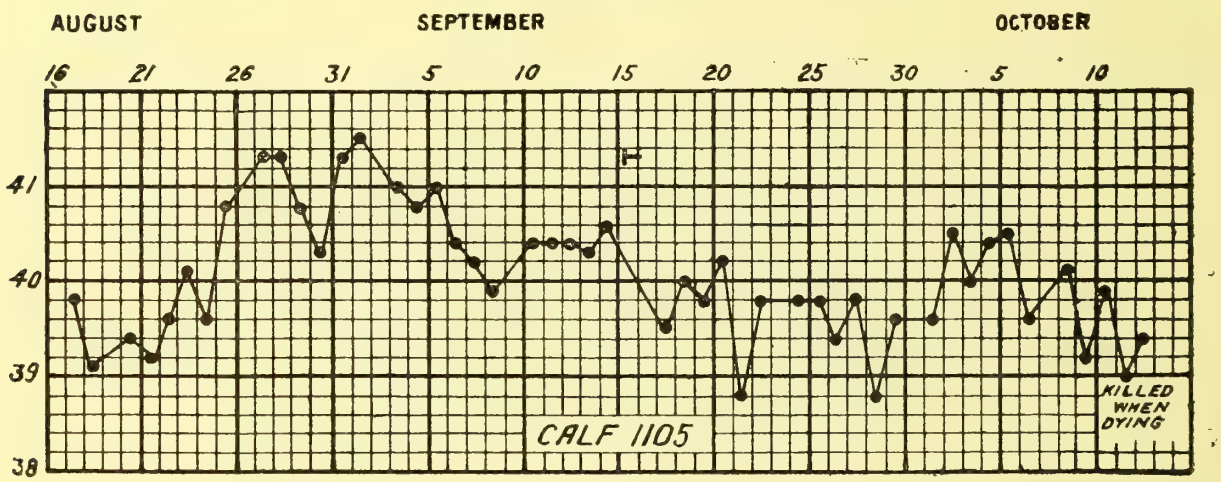
Weight at Inoculation—1 cwt. 0 qr. 0 lb. (Age about 9 weeks.)

Killed—October 12th, 1906. (57 days after inoculation.)

Clinical Notes.

The course of the disease in this calf was similar to that usually seen in calves suffering from acute tuberculosis. It was killed when dying on October 12th, 1906, 57 days after inoculation.

Temperature.



Weights.

	cwt.	qrs.	lbs.
August 16th, 1906 - - -	1	0	0
October 12th, 1906 - - -	0	3	12

Total loss of weight during experiment.—16 lbs.

Rate of loss per week.—2 lbs.

POST-MORTEM EXAMINATION.

General Condition.—Thin.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a well defined firm tumour, which measured 4 in. by 3½ in. by 1¾ in., and weighed 10 ozs.

On section it was composed of a layer, lenticular in outline, and three quarters of an inch in greatest thickness, of yellow homogeneous caseo-necrotic substance, which was closely adherent to, and extensively infiltrated, the skin covering it; and a layer of fibroid muscular tissue, closely beset with irregular yellow coalescing caseous nodules.

Riyht Prescapular Gland.—Weighed 4 ozs., and measured 4 in. by 2 in. by 1¾ in. On section it was composed throughout of very dense homogeneous pinkish yellow caseo-necrotic tissue. The capsule was lightly adherents.

Left Prescapular Gland.—Contained a number of firm yellow caseous nodules similar to those in the precrural glands. (*See* below.)

Right Prepectoral Glands.—The reniform gland on the right side showed on section the cortex composed of a rather firm tissue, closely beset with small caseous tubercles; the medulla was soft and œdematous. The gland was an inch in length. A smaller gland, near the reniform gland, was similarly affected.

Axillary Glands.—The right showed part of the cortex beset with minute discrete caseous tubercles. The left contained a number of firm yellow caseous nodules similar to those in the precrural glands. (*See* below.)

Cervical Glands.—Two cervical glands on the right side were slightly enlarged, and showed the cortices extensively replaced by coalescing caseous nodules.

Thorax.

Pleura.—The costal pleura on the left side showed two or three loosely pedunculated nodules, and there was a similar one on the diaphragmatic pleura. On the pleura covering the pericardium there were several loosely attached nodules similar to those on the omentum. (*See* below.) On the costal pleura on the right side there were several discrete nodules, and two large flat growths composed of confluent nodules.

Lungs.—The lungs were voluminous and heavy, and weighed 5 lbs. 14 ozs. The cephalic, right middle, and antero-ventral portions of the caudal lobes were pinkish red in colour, firm, and quite airless. The remaining portions of the caudal lobes were crepitant, but felt as though filled with nodular masses, which were seen under the pleura as irregular shaped greyish red areas. There was a sharp line of demarcation between the consolidated and crepitant portions of the lung. The consolidated lobes showed on the surface fairly numerous projecting caseating nodules, some of which had overhanging margins. On section most of the lobes contained grey foci, suggesting early tuberculous infiltration, whilst some were dense and almost uniformly caseous. The bronchi in the lobes were filled with yellow muco-pus.

The crepitant portions of the caudal lobes contained moderately numerous firm yellow caseous nodules, ranging in size up to that of a small pea, and also numerous firm masses of various sizes, occupying part or the whole of a lobule. In several cases all the lobules supplied by a particular bronchus were affected. These solid lobules on section were yellow and caseous throughout, except for some small foci and streaks of grey translucent tissue. The caseated tissue showed numerous points of congestion.

Thoracic Glands.—The bronchial and mediastinal glands were much enlarged, and together weighed 8½ ozs.

On section the cortices of the former were composed practically throughout of dense, opaque, yellowish-white caseated tissue, which contained streaks and foci of calcification. The mediastinal glands were not quite so

advanced in caseation, and showed a small amount of translucent grey tissue between the caseous patches.

Heart.—Normal. On the intima of the superior vena cava, near the auricle, there were a few minute greyish granules.

Abdomen.

Peritoneum, Omentum.—On the inferior surface of the omentum there were moderately numerous firm lenticular nodules, the largest about 7 millimetres in diameter. They were most numerous along the attachment of the omentum to the rumen, where they occurred in clusters. Some were very loosely attached, and deeply hæmorrhagic. On section they had yellow necrotic centres.

Œsophagus.—The mucous membrane of the upper part of the œsophagus showed a minute ulcer, with thickened margins and base, but with no sign of caseation.

Intestines.—In the Peyer's patches throughout the whole length of the small intestine were yellow caseous nodules, the largest the size of a hemp seed. They were most numerous in the long patch, the others containing only one to three each.

A few of the solitary follicles in the cæcum were enlarged and caseous.

Gastric Glands.—Were enlarged, and closely beset with caseating nodules, the cortex in two or three cases being entirely replaced.

Mesenteric Glands.—The chain of mesenteric glands contained numerous caseating nodules, irregular in outline and varying in size from 2 up to 10 millimetres in diameter.

Spleen.—Weighed 8 ozs. It showed on the surface half a dozen flattened fibro-caseous nodules, the largest 5 millimetres in diameter. On section the pulp was crowded with firm greyish yellow somewhat translucent nodules, up to 4 millimetres in diameter. A good many of these nodules showed in the centre a minute opaque yellow calcareous focus.

Liver.—Was soft, and much paler than normal. It showed on its surface moderately numerous nodules ranging in size from a mere speck up to 5 millimetres. The larger ones had yellow caseous centres and grey margins, and were flattened, slightly raised above the surface, and "mushroomed." The smaller ones had a whiter colour, and projected only slightly, or were dimly seen through the capsule.

On section greyish white nodules, ranging in size from a mere point up to that of a hemp seed, were evenly distributed throughout the substance.

Gall Bladder.—Normal.

Portal Glands.—Were moderately enlarged. On section two were closely packed with coalescing caseating nodules. A third showed the cortex composed of irregular yellow caseous patches, separated by a small amount of dense translucent fibroid tissue.

Kidneys.—Were pale. They showed in the cortex sparsely scattered nodules, the largest about 2 millimetres in diameter. These on section were opaque, white, and had narrow grey margins; many of the larger ones were elongated in a radial direction, and surrounded by a number of minute tubercles.

Suprarenals.—Each showed in the cortex three or four pinhead-sized greyish white tubercles.

Renal Glands.—A renal gland was only slightly enlarged, but closely beset with caseous coalescing nodules.

Lumbar Glands.—Were only slightly enlarged, but closely beset with caseous coalescing tubercles.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural.—Contained fairly numerous firm yellow caseous nodules, somewhat irregular in outline, and ranging in size up to that of a hemp seed. Most of the nodules showed minute calcareous foci in their centres.

Ischiatic, Pubic, Gluteal, Popliteal, Submaxillary, Subparotid, Pharyngeal, and Hyoid.—Contained a varying number of nodules similar to those in the precrural glands.

Tongue.—Normal.

Tonsils.—The left contained a hemp seed sized yellow caseous nodule, with a minute calcareous grain in the centre. The right was normal.

Pharynx.—Normal.

Larynx.—The mucous membrane of the larynx showed two superficial ulcers, 2 mm. across, with slightly raised congested margins and thin caseous base.

Eyes.—Normal.

CALF 1123. (Virus H 64. "M.G.")

Subcutaneous Inoculation of culture derived from human meninges through Guinea-pig 1880.

Dose—10 milligrammes.

Date—August 16th, 1906.

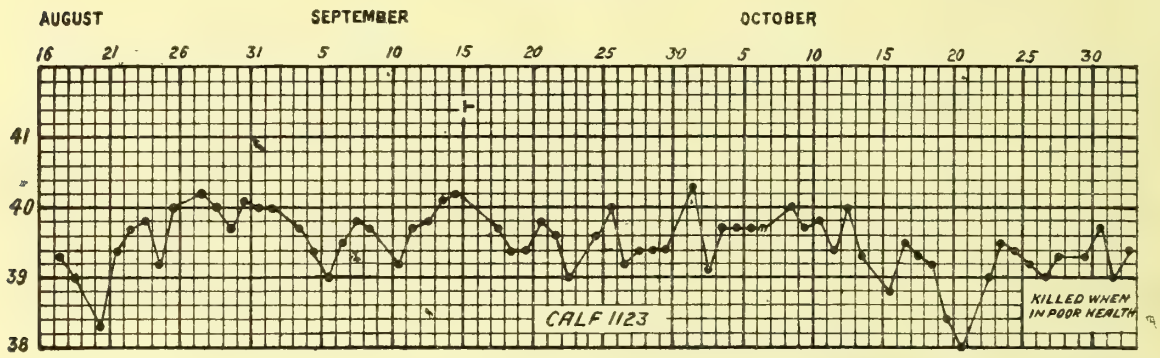
Weight at Inoculation—2 qrs. 23 lbs. (Age about 4 weeks.)

Killed—November 1st, 1906. (77 days after inoculation.)

Clinical Notes.

The calf developed the usual firm solid tumour at the seat of inoculation, and the neighbouring glands became greatly enlarged. It was killed when in poor health, but not acutely ill, on November 1st, 77 days after inoculation.

Temperature.



Weights.

	qrs.	lbs.
August 16th, 1906 - - - -	2	23
November 1st, 1906 - - - -	3	11

Total gain of weight during experiment.—16 lbs.

Average rate of gain per week.—1·5 lbs.

POST-MORTEM EXAMINATION.

General Condition.—Fair.

At the Seat of Inoculation.—On the right side of the neck there was a prominent firm tumour measuring 4 in. by 3½ in., by 2½ in. in greatest thickness.

On section it was composed partly of a mass of juicy caseo-necrotic substance, breaking down in the centre, 1 in. in greatest diameter, and partly of fibroid muscular tissue beset with irregular gritty caseous nodules of various sizes. The skin was thoroughly adherent, thickened, and beset with small caseous gritty tubercles except over the centre of the tumour, where it was penetrated throughout its whole thickness by a caseous wedge continuous with the caseo-necrotic mass described above.

The Right Prescapular Gland.—Measured 3 in. by 1¾ in. by 1½ in., and was composed practically throughout of dense pinkish yellow caseo-necrotic substance, containing sparsely scattered calcareous grains; the capsule was distinctly thickened.

Right Prepectoral Glands.—The rounded prepectoral gland, ¾ in. in diameter, was dense and caseous throughout, and embedded in a mass of fibrous tissue beset with caseous gritty nodules.

A deeper gland smaller than the above contained a firm patch infiltrated with caseous points.

The reniform prepectoral gland measured ¾ in. by ½ in by ½ in., and showed in the centre a caseous slightly gritty mass, ½ in. greatest diameter.

Cervical Glands.—On the right side one, in the middle of the neck, the size of a kidney bean, resembled on section the prescapular. Other cervical glands appeared normal.

The Left Prescapular Gland.—1½ in. in length, showed in the cortex a yellow caseous gritty tubercle the size of a rape seed.

The Left Prepectoral Gland.—Contained a pin-head sized caseous tubercle.

The Axillary Glands.—Were normal.

Thorax.

Pleura.—The costal pleura was normal. On the diaphragmatic pleura there was an eruption of slightly raised transparent granules.

Lungs.—On opening the chest the lungs collapsed almost to their full extent. Weight 2 lbs. 10 ozs.

They showed on the surface numerous nodules (about 30 to a square inch in a cephalic lobe) ranging in diameter from 1 to 6 mm. Most of the nodules were surrounded by angular red zones of consolidation, which gave the surfaces of the lungs a mottled appearance; there were no large areas of consolidation such as are constantly seen in the more acute cases.

The nodules projected from the surface, particularly those in the cephalic lobes, and on section closely resembled the nodules in the liver and spleen.

In each caudal lobe there were two or three large masses which occupied the whole or part of a lobule; on section these were composed of dense translucent fibroid tissue containing patches or a network of caseation.

The Bronchial and Mediastinal Glands.—Were moderately enlarged; they weighed together 5 ozs.

On section the cortices were composed throughout, with the exception of a few islets of grey translucent tissue, of dense gritty creamy-white caseous substance.

Heart.—Normal.

Abdomen.

Omentum.—On the inferior surface of the omentum there were two firm lenticular nodules, the largest, loosely pedunculated, measuring 6 mm. in diameter. On section they were yellow and caseous in the centre, grey and translucent around the margins.

Peritoneum.—Normal.

The Liver.—Was normal in general appearance. It showed on the surface not very numerous nodules (about five to the square inch), ranging in diameter from 2 to 7 mm. The nodules were caseous and gritty, and had translucent fibrous margins; the larger ones were flattened and slightly raised above the surface. On section of the liver similar nodules up to 3 mm. in diameter were evenly distributed throughout the substance.

Gall-Bladder.—The mucous membrane showed a small ulcer with raised margins and slightly thickened base showing no sign of caseation.

The Portal Glands.—Were slightly enlarged and contained a small number of discrete caseo-calcareous nodules, with fibrous margins, up to 5 mm. in diameter.

Spleen.—Weight 5¾ ozs. (not enlarged). On the surface were two or three congested processes of connective tissue. The pulp contained moderately numerous nodules 2 to 6 mm. in diameter; these had yellow caseous gritty centres and translucent grey margins.

Kidneys.—The left showed on the surface four grey translucent nodules with yellow gritty caseous centres, the largest the size of a hemp-seed; none were seen on section.

In the cortex of the right kidney there were three similar nodules.

Both kidneys showed besides the large nodules a number of minute grey foci.

Suprarenal Bodies.—The right showed in the cortex a nodule 2 mm. in diameter with a caseous gritty centre, and a small tubercle with an opaque centre. The left was normal.

Lumbar Glands.—Two contained each one caseo-calcareous nodule, the largest the size of a wheat-grain. The others were normal.

The Renal Gland.—Contained about half-a-dozen irregular yellow caseous gritty nodules, up to a millet seed in size.

The Iliac Glands.—Were normal.

Alimentary Tract.

Tongue, Pharynx, Tonsils, Trachea, and Larynx.—Normal.

Intestines.—In the small intestine one Peyer's patch contained two small caseous nodules ulcerated on the mucous surface; in the jejunum there was a similar submucous nodule.

The large intestine was normal.

Gastric Glands.—Some of the gastric glands contained caseo-calcareous tubercles.

The Mesenteric Glands.—Were not enlarged. Nearly all showed in the cortex one or two firm irregular caseo-calcareous nodules; the largest nodule measured about ⅝ in. by ¼ in.

Cœliac Glands.—Two showed about half-a-dozen yellow caseo-calcareous nodules; another contained one; the rest were normal.

Genito-Urinary System.

Uterus.—Normal.

Supramammary Glands.—Normal.

Various Lymphatic Glands.

Left Precrural.—Contained one hemp-seed-sized yellow caseous nodule, gritty in the centre.

Right Precrural.—Normal.

Both Popliteals.—Normal.

Each *Gluteal* showed in the cortex a millet-seed-sized caseous tubercle with a translucent fibrous margin.

Right Ischiatic.—Normal. Left not found.

Submaxillary.—The right contained two caseo-calcareous nodules the size of hemp-seeds with greyish-red margins. The left contained one similar but smaller nodule.

Parotid.—Each contained a millet-seed-sized caseo-calcareous tubercle.

Pharyngeal.—One contained half-a-dozen caseo-calcareous nodules with reddish-grey margins, the largest a little larger than a hemp seed. In the other gland there was only one small nodule.

Microscopic Examination.

Tubercle from Small Intestine.—Few tubercle bacilli.

VIRUS H 65. "K.B."

MESENTERIC GLANDS. (Post-mortem.)

VIRUS H 65. "K.B.

MESENTERIC GLANDS.

CULTURE INOCULATION.

July 5, 1906.

Strain derived from human mesenteric glands, through Guinea-pig 1835.
Tested for virulence after $3\frac{2}{3}$ months' artificial cultivation.
Fifth subculture on pure serum used for injection, when 21 days old.



BULL-CALF 1085.
Subcutaneous.
Dose : 10 mg.
Killed (when dying),
August 25, 1906.
51 days.
General tuberculosis, severe.



BULL-CALF 1089
Subcutaneous.
Dose : 10 mg.
Died, August 12, 1906.
38 days.
General tuberculosis, severe.



BULL-CALF 1093.
Subcutaneous
Dose : 50 mg.
Died, August 4, 1906.
30 days.
General tuberculosis, severe.

RABBITS.

923	10 mg.	Died, 17 days	G.T.
922	1· „	„ 28 „	„
921	1· „	„ 30 „	„
920	0·1 „	„ 28 „	„

VIRUS H 65. "K.B."

"K.B.," A FEMALE CHILD AGED ONE AND A HALF YEARS, ADMITTED TO HOSPITAL ON JANUARY 18TH, 1906, SUFFERING FROM WHOOPING COUGH. DIED ON JANUARY 25TH, 1906.

Family History.—There was no history of tuberculosis in the family. Of nine brothers and sisters of the patient four were living, and of the remaining five three died from bronchitis, one from measles, and one from premature birth.

Clinical History.—The patient had been prematurely born, labour having been induced at the thirty-sixth week on account of the mother having a contracted pelvis. The child was breast-fed for eleven weeks. When five months old she had bronchitis and slight pneumonia.

She was admitted to hospital suffering from whooping-cough. She was not very ill, and appeared to be a well-nourished child. No special symptoms were noted, except signs of slight bronchitis.

Two days after admission the temperature rose, the child became very ill, and died five days later.

POST-MORTEM EXAMINATION.

There were no scars in the neck, or elsewhere.

Thorax.

Lungs.—Showed no evidence of tuberculosis.

Bronchial Glands.—Normal.

Abdomen.

Peritoneum.—Normal.

Intestines.—Showed scattered tuberculous ulcers, extended from the beginning of the jejunum to the anus.

Mesenteric Glands.—Enlarged and caseating.

Liver.—Normal.

Kidneys.—Normal.

Spleen.—Showed a few superficial tubercles.

Brain and Meninges.—No tubercles.

Bones.—Healthy.

Joints.—Healthy.

DESCRIPTION OF MATERIAL RECEIVED AT BLYTHWOOD.

Mesenteric Glands.—These were enlarged. The largest gland measuring $\frac{3}{4}$ in. by $\frac{1}{2}$ in. was found on section to consist almost entirely of caseating material. Such portions of the gland as were not caseating consisted of tough fibrous tissue. There were two other glands nearly as large, similar on section; and a number of smaller glands, ranging in size from a pea to a French bean, most of which were firmer than normal, and showed indefinite opaque foci in the cortex. None of the glands were calcareous.

Microscopical Examination.

Foci from one of the Smaller Mesenteric Glands.—Showed a few tubercle bacilli.

Emulsion of the Fibro-Caseous Glands.—Showed more numerous tubercle bacilli, which were somewhat short.

CALF 1085. (VIRUS H 65. "K.B.")

Subcutaneous Inoculation of culture derived from human mesenteric glands, through Guinea-pig 1835.

Dose—10 milligrammes.

Date—July 5th, 1906.

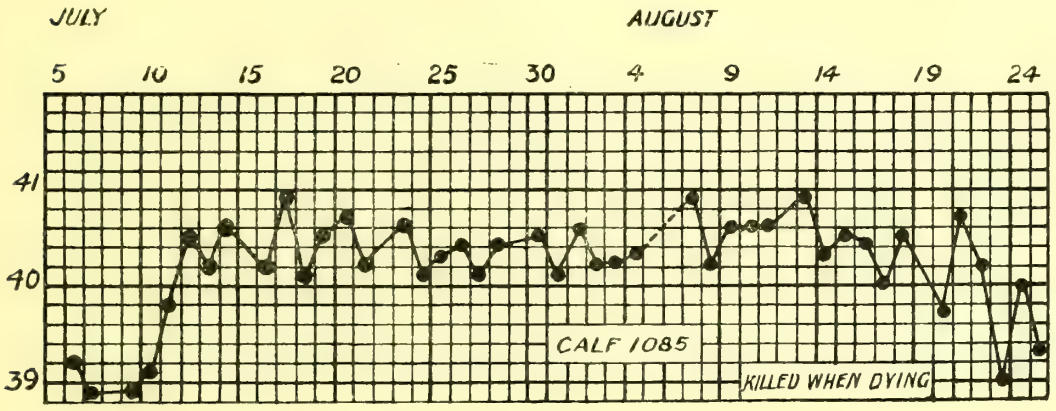
Weight at inoculation—1 cwt. 0 qr. 13 lbs. (Age about 12 weeks.)

Killed—When dying, August 25th, 1906. [51 days after inoculation.]

Clinical Notes.

The calf was inoculated on July 5th, 1906. The course of the disease was similar to that usually seen in calves suffering from acute tuberculosis. The calf was killed when in a dying condition on August 25th, 51 days after injection.

Temperature.



Weights.

	cwt.	qrs.	lbs.
July 5th, 1906 - - - -	1	0	13
August 25th, 1906 - - -	0	3	26

Total loss of weight during experiment.—15 lbs.

Average rate of loss per week.—2 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Thin.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a very large tumour, composed partly of a fibro-necrotic mass, the skin over which was thickened and sloughing, and a much larger amount of muscle infiltrated with tubercle. It measured 7½ in. by 7½ in. by 3¼ in.

Right Prescapular Gland.—Was much enlarged, and caseo-necrotic throughout. It measured 4¼ in. by 2½ in. by 2¾ in., and weighed 9 ozs.

Left Prescapular Gland.—Packed with large fibro-caseous tubercles.

Prepectoral Glands.—The right prepectoral gland was as large as a cherry, and caseo-necrotic.

Pectoral Glands.—Were very much enlarged, and packed with caseous tubercles.

Axillary Glands.—Packed with large fibro-caseous tubercles.

Cervical Glands.—Several deep cervical glands on the right side were greatly enlarged and caseous.

The Right Hyoid Gland was greatly enlarged and caseous.

Thorax.

Pleura.—There were a few large groups of tubercles on the costal pleura.

Lungs.—Weighed 6 lbs. 13 ozs. The anterior parts of each lung were studded with large prominent tubercles. Many of these were as large as peas, and some, less regular in shape, were as much as ½ in. in diameter. The anterior lobes were partly consolidated.

Section showed tubercles, many of them as large as small peas, arranged in groups, and scattered moderately thickly throughout the organ.

Trachea.—No tubercles were seen.

Thoracic Glands.—Were very much enlarged. Together they weighed 1 lb., the long thoracic alone weighing 7 ozs., and measuring 6 in. by 1¾ in. by 1¾ in. They were firm, and largely composed of a caseous network, the intervals of which were composed of pinkish grey translucent fibrous tissue.

The peribronchial glands were much enlarged and caseous.

Heart.—There was a rather large tubercle in the endocardium of the right auricle, and another just under the pericardium of the left ventricle.

Abdomen.

Peritoneum, Omentum.—There were many small tubercles loosely attached to the omentum. Peritoneum normal.

Intestines.—Several caseating tubercles were seen in the small intestine. The large intestine was normal.

The Mesenteric Glands.—Were all of them packed with large and sometimes confluent fibro-caseous tubercles and nodules.

The Spleen.—Was enlarged, weighed 13 ozs., and contained numerous large caseous tubercles.

Liver.—On the surface of the liver were a moderate number of large raised tubercles, some of which were ¼ in., and one or two ½ in. in diameter. Besides these were a moderate number of large caseous tubercles more deeply seated. Section showed a small number of tubercles similar to the latter scattered throughout the organ.

The Portal Glands.—Were very greatly enlarged, and their cortices were composed of large confluent tubercles.

Kidneys.—There were a small number of rather large caseous tubercles in the cortex of each kidney.

The Suprarenals.—Were normal.

The Renal, Lumbar, and Iliac Glands.—Contained large caseo-fibrous tubercles, sometimes confluent.

Genito-Urinary System.

Testes—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal, Left Hyoid, Submaxillary, Subparotid, Posterior Pharyngeal.—Were packed with large and sometimes confluent fibro-caseous tubercles and tuberculous nodules.

Tongue.—Normal.

Palate.—There were tubercles on the under surface of the soft palate.

Tonsils.—Each tonsil contained tubercles.

Pharynx.—There were tubercles in the naso-pharynx.

Larynx.—No tubercles were seen.

Eyes.—Normal.

CALF 1089. (VIRUS H 65. "K.B.")

Subcutaneous Inoculation of culture derived from human mesenteric glands through Guinea-pig 1835.

Dose—10 milligrammes.

Date—July 5th, 1906.

Weight at Inoculation—1 cwt. 0 qr. 8 lbs. (Age about 11 weeks.)

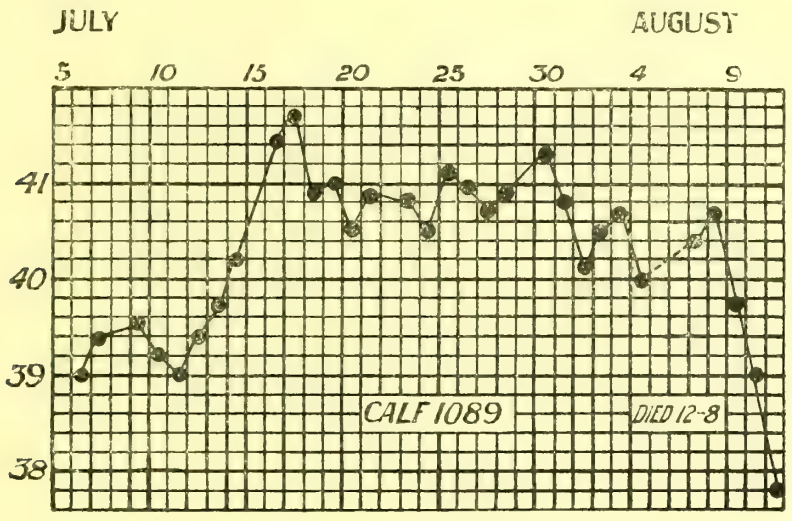
Died—August 12th 1906. [38 days after inoculation.]

Clinical Notes.

The calf was inoculated on July 5th, 1906. The course of the disease was similar to that usually seen in calves suffering from acute tuberculosis.

The calf died on August 12th, 38 days after injection.

Temperature.



Weights.

	cwt.	qrs.	lbs.
July 5th, 1906 - - - -	1	0	8
August 12th, 1906 - - - -	0	3	22

Total loss of weight during experiment.—14 lbs.

Average rate of loss per week.—2·6 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Very thin.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a solid tumour, which measured 4½ in. by 5 in. by 2¼ in. The overlying skin was greatly thickened and infiltrated. The greater part of the tumour consisted of a dense fibro-necrotic mass, which infiltrated the subjacent muscle.

Right Prescapular Gland.—Was firm and yellow, and caseo-necrotic throughout. It measured 4 in. by 2 in. by 1¾ in., and weighed 7 ozs.

Left Prescapular Gland.—Contained rather large caseating tubercles.

Prepectoral Glands.—The prepectoral glands resembled the right prescapular.

Axillary Glands.—Contained rather large caseating tubercles.

Cervical Glands.—Several deep cervical glands resembled the right prescapular.

Thorax.

Pleura.—There were many little tubercles on the costal pleura following the line of the posterior margin of the ribs. There were many tubercles on the pleural side of the diaphragm and on the pericardium.

Lungs.—Were firm and large, and weighed 5 lbs. 12 ozs. The anterior parts were of a dark red colour. Their surfaces were thickly studded with small prominent tubercles, which in many places had run together, forming nodules ¼ in. or so in diameter. Section showed that the lungs were packed with small tubercles, the average diameter of which was $\frac{1}{16}$ in. Their centres were yellow and opaque, and their margins grey and translucent.

Trachea.—Normal.

Thoracic Glands.—Were greatly enlarged. The posterior thoracic measured 5½ in. by 2 in. by 1 in., and weighed 4 ozs. They were firm, but less so than the right prescapular, and composed of a network of caseating foci, the intervals of which were filled with dense and translucent tissue.

Heart.—There was a small tubercle in the endocardium of the right auricle, and another in that of the right ventricle.

Abdomen.

Peritoneum, Omentum.—There were a good many tubercles attached to the omentum, and a few on the peritoneal surface of the diaphragm.

Intestines.—In one of the Peyer's patches of the small intestine a few small tubercles were seen. The large intestine was normal.

Mesenteric Glands.—All the glands contained rather large caseating tubercles.

Spleen.—Was packed with yellow tubercles about ⅛ in. in diameter.

Liver.—The surface was studded with tubercles of varying sizes, many $\frac{1}{16}$ in., some ⅛ in. and slightly prominent, and a few ¼ in. more raised, and with overhanging margins. Section showed tubercles rather thickly scattered throughout the organ.

Portal Glands.—Were large and firm, and consisted of confluent tubercles with yellow centres and grey margins.

Kidneys.—There was a moderate number of small tubercles in the cortex of each kidney, mostly just beneath the capsule.

Suprarenals.—Two tubercles were seen in the right, but none in the left.

Renal Glands, Lumbar Glands, Iliac Glands.—All contained rather large caseating tubercles.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal, Submaxillary, Subparotid, Posterior Pharyngeal, Hyoid.—All contained rather large caseating tubercles.

Tongue.—Normal.

Tonsils.—One tubercle was seen in the left. The right was normal.

Pharynx.—The mucous membrane of the pharynx was normal.

Larynx.—Normal.

Eyes.—Normal.

Microscopical Examination.

Tubercle from Small Intestine.—Tubercle bacilli.

CALF 1093. (VIRUS H 65. "K.B.")

Subcutaneous Inoculation of culture derived from human mesenteric glands through Guinea-pig 1835.

Dose—50 milligrammes.

Date—July 5th, 1906.

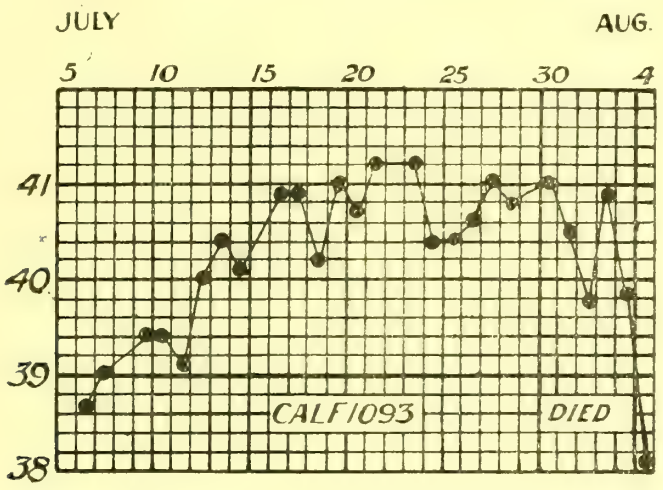
Weight at Inoculation—1 cwt. 0 qr. 7 lbs. (Age about 11 weeks.)

Died—August 4th, 1906. [30 days after inoculation.]

Clinical Notes.

The calf was inoculated on July 5th, 1906. The course of the disease was similar to that usually seen in calves suffering from acute tuberculosis. The calf died on August 4th, 30 days after injection.

Temperature.



Weights.

	cwt.	qrs.	lbs.
July 5th, 1906	1	0	7
August 4th, 1906	0	3	16

Total loss of weight during experiment.—19 lbs.
Average rate of loss per week.—4·4 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Thin.

Local Lesion.—At the seat of inoculation, on the right side of the neck, was a large solid tumour, which measured 7½ in. by 5 in. by 2¾ in., and weighed 2 lbs. The skin over it was scaly, but not cracked. It was caseo-necrotic, and infiltrated the skin and subjacent muscle. It had a large irregular cavity in the centre, which contained a reddish turbid fluid.

Right Prescapular Gland.—Measured 6 in. by 2¾ in. by 2 in. It was very firm, and consisted of the usual caseo-necrotic tissue.

Left Prescapular Gland.—Contained several tubercles.

Prepectoral Glands.—Were each the size of a cherry, and similar in structure to the right prescapular.

Axillary Glands.—The right contained several tubercles. The left was normal.

Thorax.

Pleura.—Normal.

Lungs.—The lungs were of a dark reddish colour throughout, and only small areas contained any air. They were as thickly peppered as possible, both on the surface and in the substance, with minute opaque tubercles.

Trachea.—Contained a few early tubercles.

Thoracic Glands.—Were very greatly enlarged. They were very firm and similar to the prescapular, but caseation was less marked.

Heart.—Two rather prominent tubercles were seen in the right auricle. The rest of the heart was normal, except for some hæmorrhages on the pericardial surface.

Abdomen.

Omentum and Peritoneum.—Normal.

Intestines.—Normal.

Mesenteric Glands.—All the glands contained tubercles, and in parts their cortex showed diffuse infiltration.

The Spleen.—Contained numerous small tubercles.

The Liver.—Was rather pale and soft, and thickly peppered both on its surface and throughout its substance with innumerable minute tubercles.

The Portal Glands.—Were enlarged, and somewhat similar to the thoracic in structure, but less advanced.

Kidneys.—There were many minute tubercles in the cortex of each kidney.

Suprarenals.—Both contained a few small tubercles.

Renal Glands, Lumbar Glands, Iliac Glands.—Each contained several tubercles.

Genito-Urinary System.

Testes.—Normal.

Special Glands.

Precrural, Pubic, Gluteal, Ischiatic, Popliteal.—Each contained several tubercles in the cortex.

Submaxillary, Subparotid, Posterior Pharyngeal, Hyoid.—These glands were enlarged, firmer than normal, and contained a few tubercles.

Tongue.—Normal.

Tonsils, Pharynx.—No tubercles were clearly seen in the pharynx or tonsils, but there were some doubtful points.

VIRUS H 66. "W.C'

PUS FROM LUMBAR ABSCESS.

(Tuberculous disease of Vertebrae.)

H 66. "W.C."

TUBERCULOSIS OF LUMBAR VERTEBRAE

CULTURE INOCULATION.

June 26, 1906.

The strain was derived from the discharge from a lumbar abscess, through G.P. 1911.

Total duration of artificial cultivation, 1½ months.

1st subculture used for injection, 21 days old, on pure serum.



COW-CALF 1079.

Subcutaneous.

Dose: 50 mg.

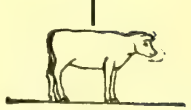
Killed, October 4, 1906.

100 days.

P.M.—Fibrous local lesion, with caseo-calcareous tubercles, and small cavities with caseo-pus. Nearest glands enlarged, containing caseo-calcareous nodules. Six small grey tubercles in lungs. (**S.T.**)

RABBIT.

915	8· mg.	K. 91 days	Tuberculosis of peritoneum, kidneys and portal glands. One tubercle in lung.
916	1· mg.	„ 91 „	Local tuberculosis only.
917	1· mg.	„ 91 „	Slight tuberculosis of peritoneum, right kidney and lungs.



BULL-CALF 1095.

Subcutaneous.

Dose: 50 mg.

Killed, September 25, 1906.

91 days.

P.M.—Minimal lesion at seat of inoculation. Caseo-calcareous nodules in prescapular gland, normal in size. (**L.T.**)

VIRUS H 66. "W.C."

W. C., Male, Aged Fifteen, Suffering from Tuberculous Disease of the Spinal Column.

Clinical History.—Before the onset of the p-esent disease the patient had been always in good health.

At the time he came under observation he was suffering from a discharging lumbar abscess. There was a slight prominence of the spinous process of the first lumbar vertebra, and some limitation of movement of the spinal column. There were no signs or symptoms of tuberculosis elsewhere.

MATERIAL RECEIVED AT BLYTHWOOD.

This consisted of some of the discharge from the lumbar sinus. Guinea-pigs were inoculated, and cultures raised from them.

The virus was selected for use at Blythwood because no case of tuberculosis of the spinal column had hitherto been investigated.

CALF 1079. (Virus H 66. "W.C.")

Subcutaneous Inoculation of Culture derived from pus from the lumbar abscess through Guinea-pig 1911.

Dose—50 milligrammes.

Date—June 26th, 1906.

Weight at Inoculation—1 cwt. 1 qr. 6 lbs. (Age about 14 weeks.)

Killed—When in good health, October 4th, 1906. [100 days after inoculation.]

Clinical Notes.

The calf was inoculated on June 26th, 1906. A large fluctuating tumour developed at the seat of inoculation, which opened and discharged. The prescapular gland became slightly enlarged.

The calf remained in good health, and grew well. It was killed on October 4th, 1900, 100 days after inoculation.

Temperature.

There was a sudden rise of temperature to 40·7°C. on the 14th day; on the 18th day it had fallen to 38·9°C. During the remaining period of the experiment the temperature remained approximately normal, the highest recorded being 39 4°C.

Weights.

	cwts.	qrs.	lbs.
June 26th, 1906 - - -	1	1	6
October 4th, 1906 - - -	2	0	0

Total gain of weight during experiment.—2 qrs. 22 lbs.

Average rate of gain per week.—5·5 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Good.

At the seat of Inoculation, on the right side of the neck, was a firm tumour measuring 2½ in. by 1½ in. by 1 in., which on section was found to be composed of thickened skin and a small mass of fibroid tissue; the latter was beset with yellow caseo-calcareous tubercles and nodules, and contained also several small cavities, the largest the diameter of a pea, filled with caseo-pus. The skin showed in the centre of the tumour a cup-shaped depression ½ in. in depth, filled with dried caseo-pus.

The Right Prescapular Gland.—Was enlarged and somewhat irregular in outline; it measured 2⅕ in. by 1½ in. by 1 in.; on section it showed at one extremity a wedge of white fibrous tissue, extending 1 in. inwards from the surface; this was surrounded by a convoluted zone of dense yellow caseous substance, ⅓ in. in greatest width, calcareous chiefly around the margins. At the other extremity of the gland the cortex showed an irregular dense yellow caseo-calcareous patch, measuring 1½ in. by ¾ in. by ½ in., penetrated at one place by a small wedge of fibrous tissue which extended in from the capsule. In the rest of the cortex there were a few isolated caseo-calcareous tubercles.

Prepectoral Glands.—The rounded prepectoral gland was hard, and measured ½ in. in diameter. On section it was firm, yellow, and caseous throughout, and had a thick fibrous capsule; the caseous substance was gritty chiefly around the periphery. Other prepectoral glands were normal.

A Mid Cervical Gland on the right side contained a caseo-calcareous nodule 1 c.m. in diameter.

The Left Prescapular and Axillary Glands.—Were normal.

Thorax.

Pleura.—Normal.

Lungs.—The lungs were crepitant and collapsed normally; on the surface under the pleura half a dozen grey tubercles ranging from a mere speck up to 1 m.m. in diameter were seen. All were opaque in the centre, the smallest one slightly, and three were distinctly gritty. No tubercles were seen on section.

Thoracic Glands.—Normal.

Heart.—Normal.

Abdomen.

Omentum and Peritoneum.—Normal.

Liver.—Normal.

Portal Glands.—Normal.

Spleen.—Normal.

Kidneys.—Normal.

Suprarenals.—Normal.

Renal, Lumbar, and Iliac Glands.—Normal.

Alimentary Tract.

Tongue, Pharynx, Palate, Tonsils.—Normal.

Retro-Pharyngeal, Submaxillary, Hyoid and Parotideal Glands.—Normal.

Intestines.—Normal.

Mesenteric Glands.—Normal.

Genito-Urinary System.

Mamma and Supramammary Lymphatic Glands.—Normal.

Various Lymphatic Glands.

Precrural and Popliteal.—Normal.

Gluteal and Ischiatic.—Normal.

Microscopic Examination.

Tubercles from Lung.—Tubercle bacilli, the majority very beaded.

CALF 1095. (Virus H 66. "W.C.")

Subcutaneous Inoculation of Culture derived from pus from the lumbar abscess through Guinea-pig 1911.

Dose—50 milligrammes.

Date—June 26th, 1906.

Weight at Inoculation—1 cwt. 0 qr. 19 lbs. (Age about 12 weeks.)

Killed—When in good health, September 25th, 1906. [91 days after inoculation.]

Clinical Notes.

The calf was inoculated on June 26th, 1906.

A small tumour developed at the seat of inoculation, and the prescapular gland became slightly enlarged. The animal remained in good health, and grew rapidly. It was killed on September 25th, 91 days after inoculation.

Temperature.

Approximately normal throughout.

Weights.

	cwts.	qrs.	lbs.
June 26th, 1906 - - - -	1	0	19
September 25th, 1906 - - -	1	3	24

Total gain of weight during experiment.—3 qrs. 5 lbs.

Average rate of gain per week.—6·8 lbs.

Tuberculin Test.

The calf was not tested subsequent to inoculation.

POST-MORTEM EXAMINATION.

General Condition.—Fat.

At the seat of Inoculation, on the right side of the neck, there was a slightly raised firm tumour 1½ in. in greatest diameter. The skin in the centre showed a depressed scar, in the centre of which there was a small opening, concealed by dried discharge.

On section the skin around the margins of the scar was seen to be thickened; beneath the latter was a small conical mass of pinkish translucent fibroid tissue containing yellow calcareous streaks and tubercles. At the apex of this, and situated just under the scar, was a small pea-sized cavity containing caseo-pus, which communicated with the exterior by the small opening mentioned above.

The Right Prescapular Gland measured 2⅛ in. by 1 in. by ½ in., and showed in the cortex at one extremity a calcareous nodule ½ in. in greatest diameter. The capsule over this was depressed and thickened. The cortex at the other extremity of the gland contained a number of discrete yellow calcareous-caseous nodules up to about 2 mm. in diameter and a small thin calcareous patch.

The Left Prescapular Gland measured 2 in. by ⅞ in. by ½ in., and was normal on section.

The Axillary Glands were normal.

Thorax.

Pleura.—Normal.

Lungs.—Normal.

Thoracic Glands.—Normal.

Heart.—Normal.

Abdomen.

Omentum and Peritoneum.—Normal.

Spleen.—Normal.

Liver.—Normal.

Portal Glands.—Normal.

Kidneys.—Normal.

Suprarenals.—Normal.

Lumbar and Iliac Glands.—Normal.

Alimentary Tract.

Tongue, Pharynx, Palate, Tonsils.—Normal.

Posterior-Pharyngeal and Hyoid, Submaxillary and Subparotid Glands.—Normal.

Intestines.—Normal.

Mesenteric Glands.—Normal.

Genito-Urinary System.

Testes.—Normal.

Eyes.—Normal.

Various Lymphatic Glands.

Precrural and Popliteal, Gluteal and Ischiatic, Pubic.—Normal.

THE VIRULENCE OF DIFFERENT STRAINS OF TUBERCLE BACILLI OBTAINED FROM MAN, FOR VARIOUS SPECIES OF ANIMALS.

THE VIRULENCE OF DIFFERENT STRAINS OF TUBERCLE BACILLI OBTAINED FROM MAN, FOR VARIOUS SPECIES OF ANIMALS.

The main object of the experiments made on animals at Blythwood Farm was to classify the various strains of tubercle bacilli obtained from man according to their virulence for different kinds of animals. In the following pages is a summary of the principal facts of these experiments, and this is followed by tables in which the details are set out.

The Species of Animals Used.

The species of animals used were the Ox, Goat, Pig, Dog, Monkey, Rabbit, Guinea-pig and Rat. Some experiments were also made on the Cat, Mouse, Fowl, and two each on the Chimpanzee and Baboon.

Of these the most generally useful for the purpose of classification were found to be the ox and the rabbit; and all viruses, except a very few of the early ones, have been thoroughly tested on both these species.

As the result of these experiments the viruses obtained from man were, with the exception of one from a case of lupus, found to be broadly separable into two groups, namely, those which caused fatal tuberculosis in the ox and rabbit and those which did not.

The susceptibility of the other animals mentioned above to these two kinds of human tubercle bacilli was determined by infecting them with a limited number of selected viruses.

Methods of Infection.

Various methods of infecting animals were used, both feeding and injection. The former was not often employed; the latter was practised sometimes subcutaneously (the usual method of infecting calves, and other large animals), sometimes intraperitoneally (the method preferred for the rabbit, guinea-pig and rat), sometimes intravenously (especially in "passage" experiments through calves), and sometimes, in the case of cows, into the milk sinuses of the udder.

The Material Injected.

The material used for injection consisted sometimes of emulsions of tuberculous tissue, and sometimes of suspensions of bacilli removed from artificial cultures. In two experiments sputum was used for feeding bovine animals.

In the case of the majority of our viruses injections were made both with emulsions of tuberculous tissue, and with cultures; but in some of the latter cases injections of tissue were omitted, and in some of the earlier ones injections of culture were not made. The tissue emulsions were made usually from the human tuberculous lesions themselves, but when the available material was not sufficient guinea-pigs were first injected and emulsions of their tuberculous tissues used for injecting calves and rabbits. In many cases emulsions of bovine tuberculous lesions were injected into other bovine animals. The cultures were raised sometimes directly from the human tissues, and sometimes from the animals injected with it, or from one of the sources mentioned above.

Estimation of the Quantity of Tubercle Bacilli in the Dose.

The number of tubercle bacilli contained in the doses of emulsion injected was estimated by Dr. Eastwood by a method of counting. As this was usually done after the animals had been injected the doses given were variable. The dose of culture injected was estimated by volume though expressed in weight, one cubic-millimetre of bacilli being assumed to weigh one milligramme. The method was as follows. The cultures for injection were sown on coagulated serum and incubated for three weeks. At the end of that time the bacilli were removed, rubbed between sterile ground glass plates with a minute quantity of fluid, and suspended in normal salt solution. A more or less homogeneous emulsion was thus formed. In cases where the dose was very small and greater accuracy of dosage was desirable, the emulsion was allowed to stand and the larger masses to settle, and only the upper layers containing the finer particles used.

The emulsion having been thus formed and thoroughly mixed a sample was taken in a carefully calibrated tube, and the latter having been sealed was centrifuged for half an hour. At the end of this time the relative length of the column formed by the bacilli which had been thrown to the bottom to the whole column were measured with a fine scale and a hand lens, and thus the relative volume of bacilli to fluid estimated.

The culture medium employed has been solidified serum. This rendered possible the use of very young cultures, and permitted glycerin to be discarded. (Glycerin-serum was, however, used in some of the earlier injections of the non-virulent viruses.) The age of the cultures actually used for injection has been in almost all cases twenty-one days, in a few nineteen or twenty-two days. This enabled us to exclude variations in our results which might depend upon there being a variable proportion of dead or effete to living and active bacilli in the suspensions injected. On the other hand the total length of time that the viruses had been growing in artificial cultivation could not be made uniform, because both old and new viruses had to be tested. In this respect great differences existed, some being used within one or two months of their being first sown on artificial media, while others had been a year or two under cultivation.

The influence on the experimental results of this difference in the total duration of artificial cultivation, though I think it can be detected, is not very marked in our tables. (*See* Report on the Stability of Virulence of Tubercle Bacilli in Artificial Culture, Appendix, Volume III).

Classification of our strains of Human Tubercle Bacilli into two Classes.

The result of the injections recorded in the following tables was to differentiate our various strains of tubercle bacilli obtained from man, very sharply into two classes (with the exception of a lupus strain already alluded to). Injected subcutaneously into the calf in suitable doses, such as 50 mg. of culture, they either produced (except in the case of one animal) rapidly fatal general tuberculosis, or in these, and even far larger doses, they produced no more than a transient disturbance of health, and localised or minimal lesions which soon became retrogressive.

The viruses which were highly virulent for the ox species were also highly virulent for the rabbit, and rapidly caused fatal tuberculosis, while those which had a low degree of virulence for the calf had also a low degree of virulence for the rabbit, and very rarely caused progressive or fatal tuberculosis.

Almost without exception our strains of tubercle bacilli have fallen into one or other of these classes, which have been called Group I. (virulent) and Group II. (slightly virulent).

No certain difference of virulence has been detected between the different members in each group, though they were carefully sought for. One primary strain alone among those of Group I., namely, H49. T.C., failed to come up to the standard of virulence of this class; but several strains similar to this have been met with in the course of certain modification experiments.

The *original* strains of those viruses which afterwards became modified in virulence by "passage" through calves are included in these tables, because there is no reason to think that they differed in any way from other viruses classified under Group II.

The virus from a case of lupus (the only one investigated up to the present), which could not be classified, possessed a high degree of virulence for the rabbit injected intraperitoneally, scarcely inferior to that possessed by viruses belonging to Group I., and a low degree of virulence for the calf, only slightly greater than that possessed by the

viruses belonging to our Group II. It did not seem possible to regard this virus as intermediate between the two groups, but rather as belonging to a special class of its own. Unlike the somewhat intermediate strain H.49. T.C., its virulence was found to be stable, and not increased by passing through a calf.

On the other species of animals already mentioned representative members of each group of our viruses were tested. The results will be fully summarised under the heading of each species. It will suffice to say here that the goat and pig were, like the ox and the rabbit, highly susceptible to the attack of tubercle bacilli belonging to Group I., and able to overcome infection with bacilli of Group II. The few experiments on the cat showed that it might be infected by feeding with bacilli of Group I., while it was highly resistant to bacilli of Group II. The chimpanzee, monkey, and guinea-pig proved highly susceptible to infection set up by either kind of bacilli, while the dog and rat, though undoubtedly possessing a high degree of resistance to both, nevertheless proved susceptible to slowly progressive and fatal tuberculosis caused by either kind, and showed no great difference in their reaction to the two. The few experiments on the mouse showed that this species reacted to the two groups of tubercle bacilli like the rat; while experiments on the fowl showed that, in exceptional cases, minimal lesions, from which cultures of the bacilli could be obtained, might be produced by viruses belonging to Group II.

A word may be said as to the sense in which the words *virus* and *strain* have been used here. The distinction, if artificial, was nevertheless found useful. A strain included all cultures derived from a given animal. A virus included all strains derived from a single original source, that is to say, from a human case of tuberculosis. Thus we speak of the virus derived from the man J. H. and the strain from guinea-pig 609 belonging to that virus.

For convenience of reference all the animals injected with *strains of tubercle bacilli classified under Group I. are printed on the left side of the page, while those injected with strains belonging to Group II. appear on the right hand side;* except in the case of those species where the total number of infected animals was small.

The Symbols used to express the Severity of an Experimental Infection.

The severity of the disease produced by an experimental infection was found to depend not only on the strain of bacilli and species of animal used but to some extent also on the dose, the mode of administration, the age and individual susceptibility of the individual. To as great an extent as was possible these difficulties were overcome by arranging our experiments in groups in each of which the first three of these dominating factors were constant. The variation of individual susceptibility in calves (which were principally used for representing the ox species) was found to be considerable. The subject is dealt with in a special section. To avoid errors due to this source the calves were as a rule injected in pairs, and in important cases larger numbers were used.

The classification of our strains of tubercle bacilli into two groups was, however, effected without difficulty, because of the great and decisive difference between them; nevertheless it was found to be desirable to employ certain symbols to express concisely the severity of an experimental infection. It was found that this could only be done by taking into consideration the anatomical range of the tuberculous lesions, and their structural state, together with the duration of the illness in fatal cases. For it is obvious that in rapidly fatal cases the lesions will not be in so advanced a stage as in those in which they have had more time to develop. *The symbols relate to the lesions only, and the effect on the life of the animal and the duration of the illness, if any, is also given, so that from these facts taken together the severity of the disease in each case can be deduced.*

Experience showed that these symbols could not be usefully extended to other animals than those of the ox species, and in these it was best to limit their use to cases of subcutaneous injection. They are fully explained on the page which immediately precedes the tables [Vol. II., section I., page 22].

THE VIRULENCE OF TUBERCLE BACILLI OF HUMAN ORIGIN FOR THE OX SPECIES.

THE VIRULENCE OF TUBERCLE BACILLI OF HUMAN ORIGIN FOR THE OX SPECIES.

The Virulence of Group I.

The calf and adult bovine animal showed themselves to be highly susceptible to tuberculosis induced by strains of tubercle bacilli belonging to our Group I. Feeding proved a less severe mode of infection than injection. But even subcutaneous injection failed to provoke a *progressive* tuberculosis if the dose were not large enough. Great indeed proved to be the influence of the dose given. 50 mg. of culture subcutaneously injected was an almost certainly fatal dose for a calf, 10 mg. was an uncertain dose, often producing fatal tuberculosis in one calf but not in another, and very small doses of either culture or tissue emulsion produced only minimal retrogressive lesions which could not be distinguished from those caused by viruses of Group II.

When one thinks how small must be the dose which causes natural tuberculosis one cannot but be astonished at the large size of the doses (10 mg.) which failed to cause serious tuberculosis in some of these animals. Doubtless tuberculosis, as is stated elsewhere, is less readily induced by bacilli from artificial cultures than by those contained in tuberculous animal tissues, yet the discrepancy is too great to be explained in this way, and one is led to believe that of those exposed to infection under natural conditions only the very susceptible become severely affected.

Many and great differences in individual susceptibility to tuberculosis were brought to light; these are dealt with in another chapter.

The Virulence of Group II.

The subcutaneous injections of bacilli of Group II. did not as a rule cause anything more serious than a swelling at the seat of injection, of greater or less size according to the dose, and which became softened and liquefied, and dense calcareous nodules in the nearest lymphatic glands. In about half the cases there were in addition some, usually very few, minute translucent tubercles, obviously in a stage of retrogression, found after careful search in the lungs, or other large organs, or some opaque calcareous grains in some of the peripheral lymph glands.* In a few calves † these little lesions were so numerous that had the symbols been made to express the *number and anatomical ranges* of the tuberculous lesions independent of their size and severity, as was originally intended, these cases must have come under the heading "general tuberculosis." But this would obviously have been misleading, for the disease was certainly not progressing when the animals were killed; they were in good condition, having completely recovered from any illness from which they might have at one time suffered; and the lesions, though numerous, were nevertheless not such as to seriously impair the functions of the organs in which they occurred. It was therefore felt that the character of the lesions, as well as their number and distribution, must be taken into consideration in applying these symbols, and this has accordingly been done.

This course has been justified and the relatively slight importance of the wideness of distribution of the lesions, as indicating the severity of an infection, has been confirmed by the discovery that the bacilli become spread broadcast all over the body immediately after a subcutaneous injection even of a strain belonging to Group II. and can be seen in microscopic sections, or demonstrated by injecting guinea-pigs with emulsions of tissue or even with the blood from the heart. (The facts relating to this discovery are separately related in the chapter on the "Distribution of tubercle bacilli in the animal body after a subcutaneous injection." Appendix, Vol. III.)

Strains of tubercle bacilli belonging to Group II. while they invariably failed to cause progressive or fatal tuberculosis in the calf when injected *subcutaneously*, even when very large doses, such as 10,000,000,000 in a tissue emulsion, or 650 milligrammes, or even 3 grammes of culture were used, nevertheless when injected *intravenously* in suitable doses caused fatal tuberculosis readily enough. That in these cases there was a real tuberculosis set up was proved not only by the presence of microscopic tubercles, but of tubercles, in some cases at least, clearly visible to the naked eye. Yet the tuberculosis did not tend to spread, and if it proved fatal did so at an early stage. The explanation of the fatal issue in these cases appeared to be extensive consolidation of lungs, caused by the confluence of the little infiltrated and œdematous areas which arose around each collection of tubercle bacilli; if these were not so numerous as to leave insufficient lung tissue to support life the tubercles underwent retrogression, the inflammatory disturbance around them subsided and the animals recovered. Thus the longest illness which proved fatal after intravenous injection was in two cases 57 days (Calf 319, H 12, H.N. and Calf 457, H 22, F.W.). These were exceptional; death took place, as a rule, either within two or three weeks, or recovery resulted. For this reason well-formed tubercles clearly visible to the naked eye were not common. Calf No. 361, (H 8, S.C., killed after 76 days), among the intravenous animals showed the most advanced tubercles.

It has been stated that even after a *subcutaneous* injection of bacilli of Group II. the micro-organisms became widely and rapidly distributed all over the body. Thus the peculiarity of tubercle bacilli of our Group II. as contrasted with that of our Group I. is not that they are unable to become *disseminated* in the body of the calf, but that when they have become disseminated they are *incapable of causing progressive disease.*

The virulence therefore of these two groups of human tubercle bacilli for the ox and rabbit, and it may be added for the pig and goat also, differ very profoundly. It seems probable that this is not a mere difference in degree, for while Group II. is far less virulent than Group I. for the ox and rabbit, etc., it appears almost equally virulent with Group I. for the very susceptible monkey and guinea-pig and for the more resistant dog and rat.

It will be asked whether the viruses classified in each group differed in virulence from one another. To this question the answer is in general negative; but one and possibly two exceptions must be made. The most notable exception was the Virus No. 49, T.C., which came from an old case of primary mesenteric tuberculosis in a young adult. The degree to which this strain of bacilli, derived directly from these mesenteric glands, fell short of the standard of Group I. is best shown by the diagrams which represent the duration of life, and therefore inversely the severity of the illness, of calves injected with known doses of cultures belonging to Group I. (*see* over). These diagrams show that the severity of the disease produced in four calves injected with 50 mg. of culture of this strain, and in two injected with 10 mg. fell distinctly short of the standard of Group I. The difference was not great but was unmistakable, and we may be confident that had differences of even this small amount existed among the other viruses they could not have been overlooked.

Among all the other calves injected with viruses of Group I., one only, No. 667, did not succumb to a dose of 50 mg. of culture. But many other bovine animals had been injected with this virus, and none of them had given any grounds for thinking that this virus H 10, B.S. was less virulent than others. The conclusion was therefore that Calf 667 was an animal of unusually high resistance, and that the virus had the standard degree of virulence.

On another occasion three calves and a heifer were injected with various doses of a tissue emulsion of Virus H 29, M.F. and none of them were so severely affected as were others which received comparable doses of bacilli

* These minute lesions are fully dealt with in a separate section. Appendix, Vol. III.

† These were Calves 185, 165, 287, 365, 405, 619, and 687.

of other viruses of Group I. in tissue emulsions. Nevertheless injections of culture of this virus hardly bore out these results. Of four calves injected with 50 mg. one indeed lived considerably longer than the average (*see* diagram), but the other three, as well as two injected with 10 mg., died in the usual time. Therefore one could only think that the lessening of the severity of the disease in the first four animals mentioned above was due to some special circumstance, and that the virulence of this virus for the Ox species was not really different from that of the other members of Group I.

It has already been mentioned that H 49, T.C., alone among the viruses which were virulent for the calf and rabbit was proved to possess a virulence for these animals which was demonstrably less than the standard of Group I. Yet another virus also, H 20, F.L. may very probably have been below this standard when first obtained from man; but of this the evidence is insufficient, no cultures having been obtained prior to the passage of the virus through a calf. Two calves were injected with an emulsion of human tuberculous tissue, and one of them was very slightly and the other not severely affected. The dose however was not large; but the animals were distinctly less affected than others which received comparable injections. (*See* table of tissue emulsion injections into calves, p. 1035.) After passing through a calf this virus had the full bovine virulence of Group I.

The lupus virus already alluded to may perhaps be considered to be one of intermediate virulence, forming a link between our Groups I. and II. Its virulence for the calf was low, almost though not quite as much so as that of the viruses of Group II.; but its virulence for the rabbit, when injected intraperitoneally, was high, almost as high as that of viruses of Group I. The bovine virulence was not raised by passing the virus through a calf; in this respect it differed from the admittedly intermediate virus "T.C," and it therefore seemed better to place it in a class by itself, at least provisionally.

Several viruses whose original virulence for the calf and rabbit caused them to be placed in Group II., attained the virulence of Group I. after passing through several bovine and other animals. In these "passage" experiments viruses of intermediate virulence were obtained. The interpretation of these modification experiments is deferred, pending further enquiry: and no conclusion can be drawn from them at present.

The viruses belonging to Group II. did not appreciably differ in virulence among themselves. A few cases did indeed develop numerous lesions in their glands or organs. But these lesions were not progressive, and other animals injected with the same viruses developed only minimal lesions. These disseminated lesions produced by viruses of Group II. are described and discussed in a separate chapter. And the conclusion is there arrived at that they occurred in individuals of relatively low capacity for resistance, and are not evidence of any degree of virulence in the viruses which produced them above the standard of this group.

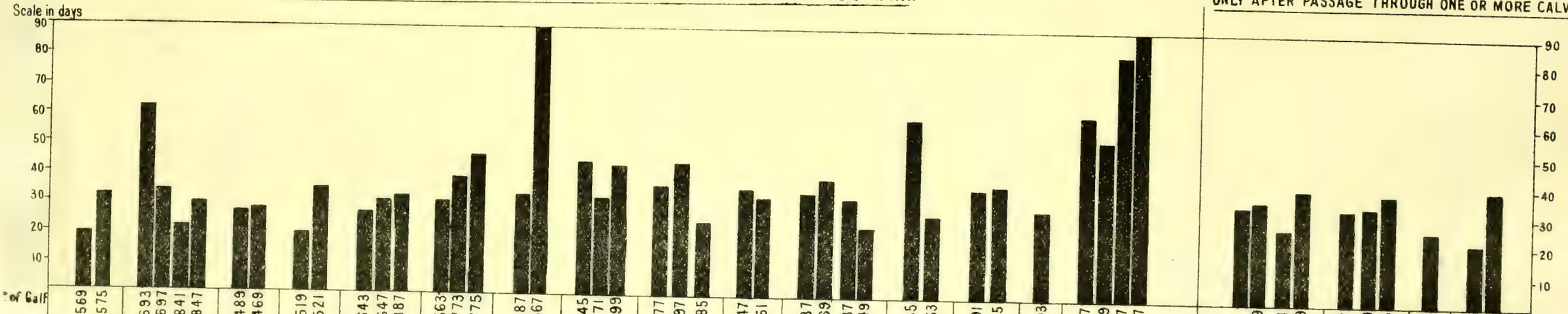
Nevertheless the contrary view may perhaps be maintained by some, on the ground that two of these viruses each *twice* produced these somewhat exceptional results. These were H 9, C.T., and H 12, H.N., and the calves were Nos. 165, 405, 287 and 619. Both viruses came from cases of primary mesenteric tuberculosis in man.

One or two of the Group II. viruses have, when injected in 50 mg. doses of culture into two calves produced less considerable swellings at the seat of injection than usual. But since one sees a great difference in this respect between two calves which received the same treatment, one probably must ascribe this to the concurrence of two resistant animals.

CHART SHOWING THE LENGTH OF LIFE IN DAYS OF CALVES AFTER SUBCUTANEOUS INJECTION OF 50 MILLIGRAMMES OF CULTURE † HUMAN ORIGIN.

[A] VIRUSES VIRULENT FOR BOVINES WHEN FIRST OBTAINED FROM MAN.

[B] VIRUSES WHICH BECAME FULLY VIRULENT FOR BOVINES ONLY AFTER PASSAGE THROUGH ONE OR MORE CALVES *



No. of Calf	569 575	693 697 841 847	489 469	519 521	643 647 887	563 773 775	387 667	545 671 899	577 597 885	547 561	587 589 837 849	965 1063	1091 1115	1093	957 959 787 797	711 729	541 559	897 739 743	825	931 949
Strain	Human Sputum through Heifer II Guinea pig 340	Human Cervical glands. through Guinea pig 1329	Human Cervical glands direct	Human Cervical glands direct	Human Cervical glands through Guinea pig 793.	Human Mesenteric glands through Calf 5, Guinea pig 448	Human Mesenteric glands through Calf 113 Guinea pig 757	Human Mesenteric glands through Guinea pig 587	Human Mesenteric glands through Heifer 239	do. do. through Goat 11	Human Mesenteric glands through Calf 213	Human Mesenteric glands, direct	Human Bronchial glands through Rabbit 166	Human Lung direct	Mesenteric gland through G.P. 1843	Human Meningeal through G.P. 1880	Mesenteric glands through G.P. 1910	Human Mesenteric glands, thro G.P. 1835	Human Mesenteric glands direct	Human Knee-joint Calf 317. 4th Passage	do do. Bull 423A 5th Passage	Human Sputum Calf 553 6th Passage	do. do Calf 571 7th Passage	Human Bronchial glands Calf 121. 2nd Pass.	Human Mesenteric glands, Calf 797 1st Passage
Virus	H.2. Sp.A	H.29. "M.F."	H.28. "C.L."	H.31. "L.F."	H.38. "J.M."	H.7. "C.M."	H.10. "B.S."	H.14. "F.S."	H.19. "S.W."	H.20. "F.L."	H.32. "Y.W."	H.59. "L.B."	H.64. "M.G."	H.65. "K.B."	H.49. "T.C."	H.16. "J.H."		H.17. "Sp.B."	H.13. "A.D."	H.49. "T.C."

† *Calf 512 received 30 milligrammes only, Calf 469, 43 milligrammes only, and Calf 1091, 45 milligrammes only, and Calf 887, 23 milligrammes only. Calf 667 which reached the 90 day limit, was in good health when killed, and was found to have general tuberculosis of moderate severity Calf 797 also was killed when in good health and was found to have slight tuberculosis only. All the others died or were in a dying condition when killed & were found to have severe general tuberculosis.*

* *H.49. "T.C." when obtained from man (see calves 957 to 797) was slightly less virulent for Calves than other virulent viruses The other viruses of this group were originally incapable of causing a progressive tuberculosis in calves.*

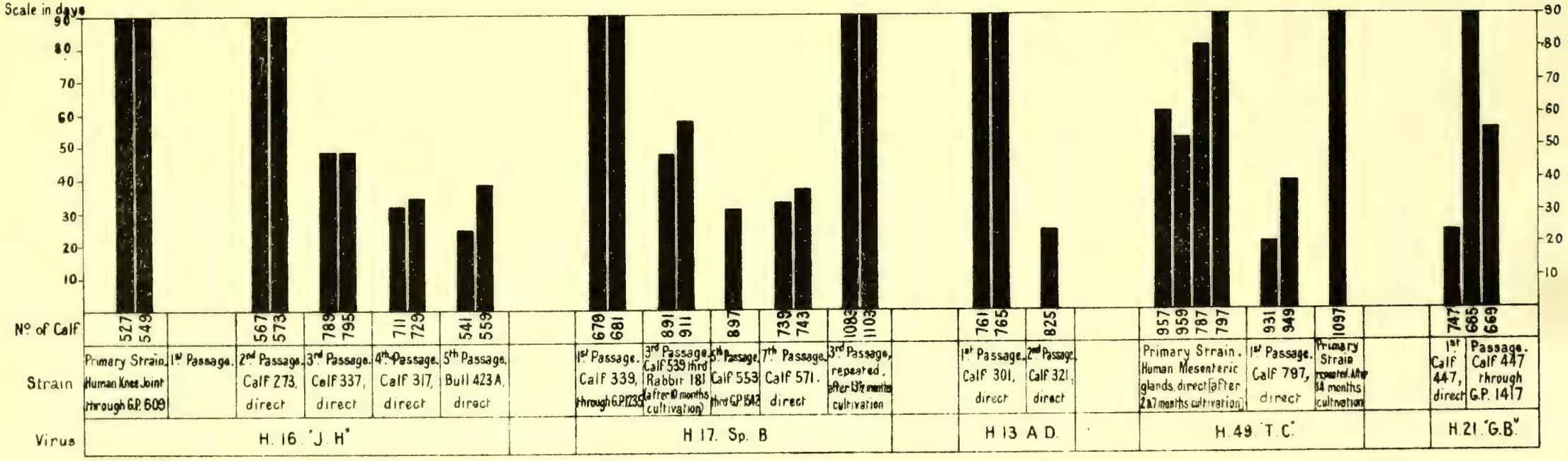
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CHART SHOWING THE LENGTH OF LIFE IN DAYS OF CALVES AFTER SUBCUTANEOUS INJECTION OF 50 MILLIGRAMMES OF CULTURE †

TO ILLUSTRATE THE MODIFICATION EXPERIMENTS, AND TO SHOW THE CHANGES OF VIRULENCE WHICH TOOK PLACE IN THE VIRUSES USED IN THEM.

ALL CALVES WHICH REACHED THE 90 DAY LIMIT WERE KILLED WHEN IN GOOD HEALTH



† *Calf 1083, H.17. "Sp. B", received 100 mg. and Calf 1103 (same strain) only 30 mg.*

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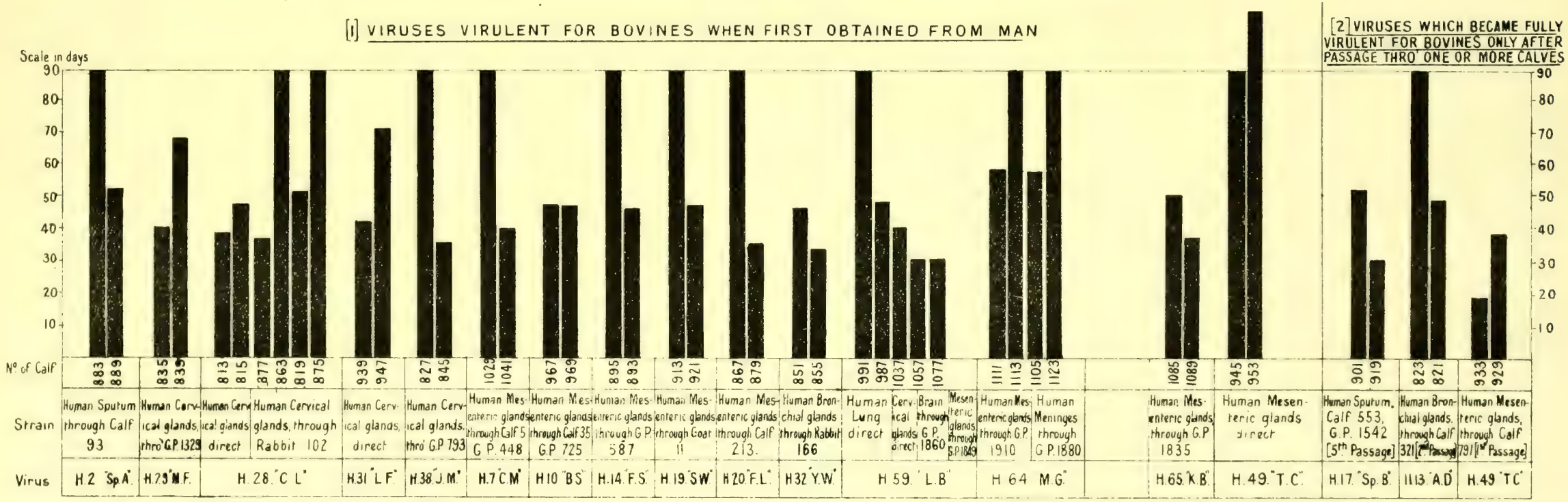
STRAINS OF HUMAN ORIGIN.

CHART SHOWING THE LENGTH OF LIFE IN DAYS OF CALVES AFTER SUBCUTANEOUS INJECTION OF 10 MILLIGRAMMES OF CULTURE

[ALL CALVES WHICH REACHED THE 90 DAY LIMIT WERE KILLED WHEN IN GOOD HEALTH, WITH THE EXCEPTION OF Nº 953, (H.49. "T.C") WHICH DIED AFTER 108 DAYS AND OF Nº 1123 (H64 "M.G") WHICH WAS IN POOR HEALTH WHEN KILLED]

[1] VIRUSES VIRULENT FOR BOVINES WHEN FIRST OBTAINED FROM MAN

[2] VIRUSES WHICH BECAME FULLY VIRULENT FOR BOVINES ONLY AFTER PASSAGE THRO' ONE OR MORE CALVES



Nº of Calf	Strain	Virus
883 889	Human Sputum through Calf 93	H.2 "Sp.A"
835 839	Human Cervical glands, thro' G.P. 1329	H.23 "M.F."
813 815	Human Cervical glands direct	H.28 "C.L"
877 863 819 875	Human Cervical glands, through Rabbit 102	H.28 "C.L"
939 947	Human Cervical glands, direct	H.31 "L.F."
827 845	Human Cervical glands, thro' G.P. 793	H.38 "J.M."
1029 1041	Human Mesenteric glands through Calf 5 G.P. 448	H.7 "C.M"
967 969	Human Mesenteric glands through Calf 35 G.P. 725	H.10 "B.S"
895 893	Human Mesenteric glands through G.P. 587	H.14 "F.S."
913 921	Human Mesenteric glands through Goat 11	H.19 "S.W"
867 879	Human Mesenteric glands through Calf 213.	H.20 "F.L."
851 855	Human Bronchial glands through Rabbit 166	H.32 "Y.W."
991 987	Human Lung direct	H.59. "L.B"
1037 1057	Cervical glands direct	H.59. "L.B"
1077	Brain through G.P. 1860	H.59. "L.B"
Mesenteric glands through G.P. 1849		
1111 1113	Human Mesenteric glands through G.P. 1910	H.64 M.G.
1105 1123	Human Meninges through G.P. 1880	H.64 M.G.
1085 1089	Human Mesenteric glands through G.P. 1835	H.65. "K.B."
945 953	Human Mesenteric glands direct	H.49. "T.C."
901 919	Human Sputum, Calf 553, G.P. 1542 [5th Passage]	H.17. "Sp.B."
823 821	Human Bronchial glands through Calf 321 [2nd Passage]	1113 "A.D"
933 929	Human Mesenteric glands, through Calf 791 [1st Passage]	H.49 "T.C"

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TABLE

OF

TISSUE EMULSION INJECTIONS INTO BOVINES:

CLASSIFIED INTO "VIRULENT" AND "SLIGHTLY VIRULENT" (FOR BOVINES), AND ARRANGED IN THE ORDER OF THE DOSES INJECTED.

TISSUE EMULSION INJECTIONS INTO BOVINES.

The number of tubercle bacilli in the tissue emulsions injected was not as a rule estimated until the emulsion had been injected. The doses of tubercle bacilli therefore vary greatly, and the results also vary more or less in proportion. For this reason, and because of the great influence which was found to be exercised by the size of the dose upon the severity of the infection produced, it is thought better to arrange the animals in the order of the number of the tubercle bacilli which they received, with the object that each may appear near those others with which it is most strictly comparable.

The calves bracketed together were injected with emulsions of human tuberculous tissues.

TISSUE EMULSION INJECTIONS INTO BOVINES.

Classified into "Virulent" and "Slightly Virulent" (for Bovines), and arranged in the order of the doses injected.

Class I.—Virulent Viruses.

Adult Bovine Animals.

(*a*) *Subcutaneous Inoculations.*

Dose in estimated number of tubercle bacilli.	No. of animal.	Virus	Result: Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
9,132,800,000	B. 383	**H 20. "F.L."**	Died after 21 days	General tuberculosis, severe.
..	H. 253	,,	Killed when very ill ,, 23 ,,	.. ,,
2,844,400,000	H 251	**H 29. "M.F."**	Killed when well ,, 138 ,,	General tuberculosis, slight.
158,333,000	Cow 63	**H 2. Sp. A.**	Died ,, 45 ,,	,, ,,
85,675,000	H. 197	**H 14. "F.S."**	Killed when ill ,, 51 ,,	General tuberculosis, moderate.
53,440,000	S.H. 233	**H 19. "S.W."**	Killed when well ,, 181 ,,	General tuberculosis, slight.
..	H. 247	,,	,, ,, ,, ,, 182 ,,	Slight tuberculosis.
4,517,000	S.H. 235	**H 14. "F.S."**	,, ,, ,, ,, 176 ,,	General tuberculosis, moderate.
,,	H. 243	,,	Killed when ill ,, 61 ,,	,, ,,
1,805,000	H. 237	**H 10. "B.S."**	Killed when well ,, 108 ,,	,, ,,
,,	S.H. 231	,,	,, ,, ,, ,, 109 ,,	General tuberculosis, slight.
1,109,000	H. 239	**H 19. "S.W."**	,, ,, ,, ,, 177 ,,	Slight tuberculosis.

B. : A Yearling Bull. The others (H. : Heifer ; S.H. : Shorthorn heifer) were 1–2 years or more old.

(*b*) *Intramammary Inoculations.*

40,000,000	Cow 143	**H 28. "C.L."**	Dying after 38 days	Slight tuberculosis.
38,000,000	Cow 75	**H 14. "F.S."**	,, ,, 34 ,,	,, ,,
1,988,000	Cow 295	**H 10. "B.S."**	Died* ,, 179 ,,	Local tuberculosis.

* Died during parturition.

TISSUE EMULSION INJECTIONS INTO BOVINES.

Classified into "Virulent" and "Slightly Virulent" (for Bovines), and arranged in the order of the doses injected.

CLASS II.—Slightly Virulent Viruses.

ADULT BOVINE ANIMALS.

(a) Subcutaneous Inoculation.

NONE.

(b) Intramammary Inoculation.

NONE.

TISSUE EMULSION INJECTIONS INTO BOVINES—*continued.*

CLASS I.—Virulent Viruses.

CALVES.

Subcutaneous Inoculations.

Dose in estimated number of tubercle bacilli.	No. of Animal.	Virus.	Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
3,447,000,000	403	H 20. "F.L."	Died after 27 days	General tuberculosis severe.
3,020,400,000	477	H 29. "M.F."	Dying „ 34 „	„ „
„	479	„	„ „ 32 „	„ „
2,348,400,000	487	H 32. "Y.W."	„ „ 22 „	„ „
1,174,200,000	465	„	Killed when very ill „ 39 „	„ „
901,466,000	513	H 28. "C.L."	„ „ „ 25 „	General tuberculosis moderate.
„	515	„	Dying „ 44 „	General tuberculosis severe.
654,160,000	533	H 32. "Y.W."	„ „ 35 „	„ „
„	537	„	„ „ 33 „	„ „
362,000,000	121	H 14. "F.S."	Killed when very ill „ 36 „	„ „
„	125	„	Dying „ 23 „	„ „
355,550,000	463	H 29. "M.F."	Killed when well „ 105 „	General tuberculosis slight.
15,877,000	271	H 19. "S.W."	Killed when very ill „ 36 „	General tuberculosis severe.
10,134,000	335	H 20. "F.L."	„ „ „ 64 „	„ „
10,000,000	501	H 29. "M.F."	Killed when well „ 104 „	General tuberculosis slight.
5,979,000	485	H 31. "L.F."	„ „ „ „ 151 „	„ „
„	491	„	„ „ „ „ 152 „	„ „
4,517,000	205	H 14. "F.S."	„ „ „ „ 78 „	„ „
2,589,000	191	H 10. "B.S."	Dying „ 60 „	General tuberculosis severe.
2,301,000	213	H 20. "F.L."	Killed when well „ 169 „	General tuberculosis slight.
„	223	„	„ „ „ „ 169 „	Local tuberculosis.
„	507	„	„ „ „ „ 172 „	General tuberculosis slight.
„	517	„	Killed when in fair health „ 172 „	General tuberculosis moderate.
1,805,800	199	H 10. "B.S."	Killed when well „ 81 „	„ „
1,546,000	159	H 19. "S.W."	Killed when ill „ 50 „	General tuberculosis severe.
„	179	„	Killed when well „ 114 „	Slight tuberculosis.
1,000,000	483	H 29. "M.F."	„ „ „ „ 105 „	General tuberculosis slight.
301,000	83	H 2. "Sp. A."	Dying „ 134 „	General tuberculosis moderate.
„	91	„	Killed when well „ 147 „	General tuberculosis slight.
250,000	139	H 7. "C.M."	Killed when ill „ 85 „	General tuberculosis moderate.
„	141	„	Dying „ 53 „	General tuberculosis severe.
48,000	103	„	Killed when well „ 130 „	General tuberculosis slight.
„	105	„	Killed when ill „ 47 „	General tuberculosis severe.
12,000	115	„	Killed when well „ 96 „	General tuberculosis slight.
„	117	„	„ „ „ „ 97 „	„ „
5,000	113	H 10. "B.S."	Killed when ill „ 120 „	General tuberculosis moderate.
„	35	„	Killed when well „ 106 „	Slight tuberculosis.

The pairs of calves bracketed together were injected with emulsions of human tissues.

TISSUE EMULSION INJECTIONS INTO BOVINES—*continued.*

Class II.—Slightly Virulent Viruses.

Calves.

Subcutaneous Inoculations.

Dose in estimated number of tubercle bacilli.	No. of Animal.	Virus.	Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
10,102,666,000	497	H 26. "K.M."	Killed when well after 87 days	Local tuberculosis.
5,124,000,000	389	H 8. "S.C."	" " " " 79 "	"
5,051,333,000	493	H 26. "K.M."	" " " " 120 "	"
5,014,800,000	631	H 16. "J.H."†	" " " " 113 "	"
4,797,600,000	433	H 21. "G.B."†	" " " " 111 "	"
"	447	"	" " " " 111 "	Slight tuberculosis.
4,756,800,000	473	H 30. "E.M."	" " " " 113 "	"
"	481	"	" " " " 123 "	"
3,140,266,000	351	"H 12. H.N."	" " " " 84 "	"
2,814,000,000	429	H 18. "T.T."	" " " " 100 "	Local tuberculosis.
1,005,353,000	417	H 25. "A.T."	" " " " 80 "	"
809,866,000	303	H 8. "S.C."	" " " " 114 "	"
479,733,000	307	H 11. "E.D."	" " " " 106 "	Slight tuberculosis.
269,916,000	405	H 18. "T.T."	" " " " 55 "	"
"	435	"	" " " " 100 "	Local tuberculosis.
261,846,000	311	H 15. "I.W."	" " " " 121 "	"
165,853,000	339	H 17. "Sp. B."†	" " " " 69 "	"
136,959,000	413	H 15. "I.W."	" " " " 70 "	Slight tuberculosis.
133,824,000	331	H 9. "C.T."	" " " " 66 "	"
123,400,000	207	H 2. "Sp. A." [non-virulent strain]	" " " " 54 "	"
	209	"	" " " " 174 "	Local tuberculosis.
103,968,000	363	H 12. "H.N."	" " " " 104 "	"
"	287	"	" " " " 106 "	Slight tuberculosis.
103,093,000	345	H 23. "J.P."	" " " " 79 "	Local tuberculosis.
"	365	"	Killed when unwell " 60 "	Slight tuberculosis
100,000,000	415	H 22. "F.W."	Killed when well " 112 "	Local tuberculosis.
"	439	"	" " " " 112 "	Slight tuberculosis.
87,273,000	449	H 25 "A.T."	" " " " 65 "	"
68,166,000	367	H 15. "I.W."	" " " " 56 "	"
41,600,000	391	H 17. "Sp. B."†	" " " " 40 "	"
40,960,000	503	H 27. "B.D."	" " " " 93 "	Local tuberculosis.
"	505	"	" " " " 93 "	"
21,973,000	443	H 11. "E.D."	" " " " 72 "	"
14,673,000	407	H 15. "I.W."	" " " " 91 "	"
16,029,000	431	H 23. "J.P."	" " " " 105 "	"
15,585,000	591	H 36. "M.D."	" " " " 90 "	"
"	621	"	" " " " 90 "	"

† This virus afterwards became increased in virulence by passage through calves.

TISSUE EMULSION INJECTIONS INTO BOVINES—*continued.*

CLASS I.—Virulent Viruses.

Subcutaneous Inoculations.

TISSUE EMULSION INJECTIONS INTO BOVINES—*continued.*

CLASS II.—Slightly Virulent Viruses.

CALVES.

Subcutaneous Inoculations.

Dose in estimated number of tubercle bacilli.	No. of animal.	Virus.	Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
14,263,000	291	H 22. "F.W."	Killed when well after 87 days.	Local tuberculosis.
12,550,000	275	H 8. "S.C."	,, ,, ,, 57 ,,	Slight tuberculosis.
,,	323	,,	,, ,, ,, 114 ,,	,,
9,120,000	393	H 9. "C.T."	,, ,, ,, 88 ,,	Local tuberculosis.
8,166,000	411	H 23. "J.P."	,, ,, ,, 82 ,,	,,
,,	421	,,	,, ,, ,, 81 ,,	Slight tuberculosis.
6,146,000	419	H 8. "S.C."	,, ,, ,, 94 ,,	Local tuberculosis.
,,	423	,,	,, ,, ,, 94 ,,	,,
4,936,000	437	H 26. "K.M."	,, ,, ,, 99 ,,	Slight tuberculosis.
,,	461	,,	,, ,, ,, 99 ,,	Nil.
4,478,000	131	H 18. "T.T."	,, ,, ,, 139 ,,	Local tuberculosis.
,,	165	,,	,, ,, ,, 57 ,,	Slight tuberculosis.
,,	453	,,	,, ,, ,, 100 ,,	Local tuberculosis.
3,797,000	203	,,	,, ,, ,, 83 ,,	,,
3,761,000	193	H 15. "I.W."	,, ,, ,, 83 ,,	Slight tuberculosis.
,,	195	,,	,, ,, ,, 132 ,,	,,
3,407,000	225	H 13. "A.D."*	,, ,, ,, 89 ,,	Local tuberculosis.
3,295,000	211	H 15. "I.W."	,, ,, ,, 130 ,,	,,
3,204,000	359	H 22. "F.W."	,, ,, ,, 99 ,,	Slight tuberculosis
3,000,000	187	H 16. "J.H."*	,, ,, ,, 81 ,,	Local tuberculosis.
2,766,000	329	H 12. "H.N."	,, ,, ,, 97 ,,	Slight tuberculosis.
,,	189	,,	,, ,, ,, 99 ,,	Local tuberculosis.
1,000,000	221	H 11. "E.D."	,, ,, ,, 89 ,,	,,
712,000	229	H 16. "J.H."*	,, ,, ,, 91 ,,	,,
700,000	341	H 17. Sp. B.*	,, ,, ,, 70 ,,	,,
310,000	269	H 12. "H.N."	,, ,, ,, 114 ,,	,,
242,000	293	H 22. "F.W."	,, ,, ,, 87 ,,	,,
156,000	279	H 21. "G.B."*	,, ,, ,, 91 ,,	Slight tuberculosis.
,,	285	,,	,, ,, ,, 91 ,,	Nil.
76,000	277	H 17. Sp. B.*	,, ,, ,, 89 ,,	Slight tuberculosis.
49,000	265	,,	,, ,, ,, 107 ,,	,,
43,000	227	,,	,, ,, ,, 114 ,,	Nil.
16,000	119	H 13. "A.D."*	,, ,, ,, 67 ,,	Local tuberculosis.
,,	129	,,	,, ,, ,, 66 ,,	,,
13,000	123	H 12. "H.N."	,, ,, ,, 96 ,,	Slight tuberculosis.
,,	135	,,	,, ,, ,, 159 ,,	,,
,,	347	,,	,, ,, ,, 97 ,,	Local tuberculosis.
10,000	155	H 16. "J.H."*	,, ,, ,, 54 ,,	,,
,,	157	,,*	,, ,, ,, 67 ,,	Slight tuberculosis.

* This virus afterwards became increased in virulence by passage through Calves.

TISSUE EMULSION INJECTIONS INTO BOVINES—*continued*

CLASS I.—Virulent Viruses.

CALVES.

Intravenous Inoculations.

Dose in estimated number of tubercle bacilli.	No. of animal.	Virus.	Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
301,000	59	**H 2. Sp. A.**	Died after 33 days	General tuberculosis.
,,	89	,,	Dying ,, 23 ,,	General tuberculosis.
48,000	95	**H 7. "C.M."**	Died ,, 40 ,,	General tuberculosis.
,,	101	,,	Dying ,, 41 ,,	General tuberculosis.

For other intravenous injections, with viruses which underwent an increase of virulence, *see* "Modification Report."

Intraperitoneal Inoculations.

Dose in estimated number of tubercle bacilli.	No. of animal.	Virus.	Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
602,000	93	**H 2. Sp. A.**	Died after 73 days	General tuberculosis severe.
48,000	109	**H 7. "C.M."**	Died ,, 40 ,,	General tuberculosis severe.
301,000	85†	**H 2. Sp. A.**	Killed when well ,, 84 ,,	General tuberculosis slight.
48,000	107†	**H 7. "C.M."**	Killed when well ,, 129 ,,	Slight tuberculosis.

† The injection, which was intended to be intraperitoneal, was subsequently found to have been into the muscular subperitoneal tissues.

TISSUE EMULSION INJECTIONS INTO BOVINES—*continued.*

Class II.—Slightly Virulent Viruses.

Calves.

Intravenous Inoculations.

Dose in estimated number of tubercle bacilli.	No. of animal.	Virus.	Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
2,044,700,000	859	H 25. "A.T."	Died after 19 days	General tuberculosis.
999,600,000	831	,,	Died ,, 17* ,,	General tuberculosis.
890,880,000	817	H 22. "F.W."	Killed when well ,, 31 ,,	Local tuberculosis.
728,879,000	305	H 8. "S.C."	Killed when very ill ,, 26 ,,	General tuberculosis.
719,733,000	339	H 22. "F.W."	,, ,, ,, 34 ,,	General tuberculosis.
345,906,000	861	H 25. "A.T."	,, ,, ,, 30 ,,	General tuberculosis.
250,000,000	811	H 22. "F.W."	Killed when well ,, 49 ,,	Slight tuberculosis.
135,250,000	409	H 15. "I.W."	Died ,, 22 ,,	General tuberculosis.
103,968,000	319	H 12. "H.N."	Dying ,, 57 ,,	General tuberculosis.
41,500,000	361	H 8. "S.C."	Killed when well ,, 76 ,,	General tuberculosis.
20,000,000	457	H 22. "F.W."	Died ,, 57 ,,	General tuberculosis.
13,357,000	441	H 23. "J.P."	Killed when well ,, 102 ,,	Slight tuberculosis.
11,248,000	467	H 25. "A.T."	,, ,, ,, 62 ,,	Slight tuberculosis.
11,150,000	505	H 21. "F.W."	,, ,, ,, 62 ,,	Local tuberculosis.

Intraperitoneal Inoculations.

Dose in estimated number of tubercle bacilli.	No. of animal.	Virus.	Fate of animal and condition at death	Amount and range of tuberculous lesions at death.
479,733,000	309	H 11. "E.D."	Killed when well after 160 days	Slight tuberculosis.

* Death from intestinal trouble.

CULTURE INJECTIONS INTO CALVES.

50 MG. CULTURE INJECTIONS INTO CALVES.

Made to ascertain the relative virulence of the different viruses.

Class I.—Virulent Viruses.

Subcutaneous.

Dose: 50 milligrammes or more.

Virus.	Probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of animal.	Weight in kilos.	Result. Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
		Origin of Virus: Human Tuberculosis, believed to be Primary in Lung.						
H 2. Sp. A. [virulent strain]	Lung	Heifer 11, through G.P. 340.	20 months	50 mg.	**569**	53·06	Dying after 20 days	General tuberculosis, slight.
		„ „	„	„	**575**	49·89	„ „ 33 „	General tuberculosis, severe.

50 MG. CULTURE INJECTIONS INTO CALVES.

Made to ascertain the relative virulence of the different viruses.

CLASS II.—Slightly Virulent Viruses.

SUBCUTANEOUS.

Dose : 50 milligrammes or more.

Virus.	Probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of animal.	Weight in kilos.	Result. Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
Origin of Virus: Human Tuberculosis, believed to be Primary in Lung.								
H 2. Sp. A. [non-virulent strain]	Lung	Calf 111, through G.P. 690.	20 months	50 mg.	**781**	44·44	Killed when well after 89 days	Slight tuberculosis.
		,, ,,	,,	,,	**801**	48·05	,, ,, 89 ,,	Local tuberculosis.
H 17. Sp. B.*	Lung	Calf 265, direct	10 months	,,	**583**	50·80	,, ,, 90 ,,	Slight tuberculosis.
		,, ,,	,,	,,	**601**	52·61	,, ,, 90 ,,	
		Calf 339, through G.P. 1235.	8 months	,,	**679**	57·60	,, ,, 91 ,,	Local tuberculosis.
		,, ,,	,,	,,	**681**	60·32	,, ,, 91 ,,	
H 22. "F.W."	Lung	Calf 293, direct	14 months	,,	**755**	57·15	,, ,, 90 ,,	Slight tuberculosis.
		,, ,,	,,	,,	**759**	53·06	,, ,, 90 ,,	
H 23. "J.P."	Lung	Calf 365, direct	8 months	,,	**625**	46·25	,, ,, 90 ,,	Slight tuberculosis.
		,, ,,	,,	,,	**639**	46·70	,, ,, 90 ,,	Local tuberculosis.
H 25. "A.T."	Lung	Calf 417, direct	10½ months	,,	**721**	59·41	,, ,, 115 ,,	Local tuberculosis.
		,, ,,	,,	,,	**727**	74·85	,, ,, 116 ,,	
H 45. "F.M."	Lung	Human bronchial gland, through G.P. 1137.	11 months	,,	**763**	52·15	,, ,, 90 ,,	Slight tuberculosis.
		,, ,,	,,	,,	**769**	53·06	Died ,, 17† ,,	—
		,, ,,	,,	275 mg.	**741**	38·10	Killed when well ,, 90 ,,	Local tuberculosis.
H 48. "W P."	Lung	Human lung, through G.P. 1494.	1½ months	50 mg.	**799**	49·40	,, ,, 90 ,,	Local tuberculosis.
		,, ,,	,,	,,	**809**	55·34	,, ,, 90 ,,	
H 50. "P.H."	Lung	Human lung, through G.P. 1490.	3 months	,,	**829**	56·24	,, ,, 112 ,,	Local tuberculosis.
		,, ,,	,,	,,	**843**	53·06	,, ,, 112 ,,	Slight tuberculosis.
H 51. "H.M."	Lung	Human lung, direct.	3 months	,,	**833**	61·68	,, ,, 77 ,,	Slight tuberculosis.
		,, ,,	4 months	,,	**907**	53·97	,, ,, 91 ,,	

* This virus increased in virulence after passage through Calves.

† Death in 17 days from diarrhœa. T.B. were sought in lungs, etc., and found in the prescapular, prepectoral and long thoracic glands, but not in lungs.

50 MG. CULTURE INJECTIONS INTO CALVES—*continued.*

Class I.—Virulent Viruses.

Subcutaneous.

Dose : 50 milligrammes or more.

Virus.	Probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of animal.	Weight in kilos.	Result. Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
		Human Tuberculosis, of uncertain Origin, possibly Primary in Bronchial Glands.						

50 MG. CULTURE INJECTIONS INTO CALVES—*continued.*

Class II.—Slightly Virulent Viruses.

Subcutaneous.

Dose : 50 milligrammes or more.

Virus.	Probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of animal.	Weight in kilos.	Result. Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
H 52. "T.F."	Lung	Human lung, through G.P. 1565.	2 months	150 mg.	**903**	60·32	Killed when well (having been ill). after 90 days	Local tuberculosis.
		„ „	„	100 mg.	**915**	50·80	Killed when well after 90 days	Slight tuberculosis.
H 56. "F.T."	Lung	Human lung, through G.P. 1682.	3 months	100 mg.	**951**	56·69	„ „ 91 „	Local tuberculosis.
		„ „	„	„	**955**	52·16	Killed when ill „ 91 „*	Local tuberculosis.
H 62. "W.M."	Lung	Human sputum, through G.P. 1786.	3½ months	50 mg.	**1,019**	46·70	Killed when well „ 91 „	Local tuberculosis.
		„ „	„	„	**1,069**	45·35	„ „ 91 „	Slight tuberculosis.
		Human Tuberculosis, of uncertain Origin, possibly Primary in Bronchial Glands.						
H 35. "C.B."	Bronchial gland (?)	Human bronchial gland, through G.P. 571.	18 months	50 mg.	**585**	51·25	Killed when well after 90 days	Local tuberculosis.
		„ „	„	„	**605**	50·80	„ „ 90 „	Slight tuberculosis.
H 54. "C.W."	Bronchial gland (?)	Human spleen, through G.P. 1609.	2 months	„	**927**	55·34	Died „ 12 „†	—
		„ „	„	„	**935**	56·69	Killed when well „ 87 „	Local tuberculosis.
H 61. "E.C."	Bronchial gland (?)	Human mesenteric gland, direct.	2 months	183 mg.	**1,015**	57·15	Killed when well (having been ill). „ 90 „	Slight tuberculosis.
		Human brain, through G.P. 1837.	1 month	50 mg.	**1,031**	46·25	Killed when well „ 92 „	Local tuberculosis.

* At the post-mortem examination the anterior lobes of each lung were found to be carnified. In two of the calyces of the left kidney were little collections of gravel, and the neighbouring kidney substance was atrophied. To this the illness of the calf was probably due.

† Death from pneumonia.

50 MG. CULTURE INJECTIONS INTO CALVES—*continued.*

CLASS I.—Virulent Viruses.

SUBCUTANEOUS.

Dose : 50 milligrammes or more.

Virus.	Probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of animal.	Weight in kilos.	Result. Fate of animal and Condition at death.	Amount and range of tuberculous lesions at death.
Origin of Virus : Human Tuberculosis, believed to be Primary in Cervical Glands.								
H 28. "C.L."	Cervical glands.	Human cervical glands, direct.	4 months	50 mg.	**489**	77·56	Dying after 28 days	General tuberculosis, severe.
		,, ,,	,,	43 mg.	**469**	70·76	Killed when very ill. ,, 29 ,,	
H 29. "M.F."	Cervical Glands.	Human cervical glands, through G.P. 1329.	8 months	50 mg.	**693**	52·61	Died ,, 63 ,,	General tuberculosis, severe.
		,, ,,	,,	,,	**697**	52·15	Dying ,, 35 ,,	
		,, ,,	11 months	,,	**841**	47·60	Died ,, 23 ,,	General tuberculosis, moderate.
		,, ,,	,,	,,	**847**	43·08	Killed when very ill. ,, 31 ,,	General tuberculosis, severe.
H 31. "L.F."	Cervical glands.	Human cervical glands, direct.	5 weeks	50 mg.	**519**	75·29	Died ,, 21 ,,	General tuberculosis, severe.
		,, ,,	,,	30 mg.	**521**	66·65	Dying ,, 36 ,,	

50 MG. CULTURE INJECTIONS INTO CALVES—*continued.*

Class II.—Slightly Virulent Viruses.

Subcutaneous.

Dose : 50 milligrammes or more.

Virus.	Probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of animal.	Weight in kilos.	Result. Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
		Origin of Virus: Human Tuberculosis, believed to be Primary in Cervical Glands.						
H 27. "B.D."	Cervical g'ands.	Human cervical glands, through G.P. 1216.	8½ months	50 mg.	675	49·40	Killed when well after 90 days	Slight tuberculosis.
		,, ,,	,,	,,	677	44·90	,, ,, 90 ,,	
H 33. "R.T."	Cervical glands.	Human axillary glands, direct.	4 months	50 mg.	595	58·96	,, ,, 90 ,,	Slight tuberculosis.
		,, ,,	,,	,,	603	63·04	,, ,, 90 ,,	Local tuberculosis.
H 34. "C.U."	Cervical glands.	Human cervical glands, through G.P. 236.	2 years	50 mg.	579	52·16	,, ,, 89 ,,	Local tuberculosis.
		,, ,,	,,	,,	581	58·96	,, ,, 89 ,,	
H 37. "O.J."	Cervical glands.	Human cervical glands, through G.P. 1427.	2½ months	50 mg.	627	53·06	,, ,, 90 ,,	Slight tuberculosis.
		,, ,,	,,	,,	629	44·90	,, ,, 90 ,,	
H 39. "M.B."	Cervical glands.	Human cervical glands, direct.	3 months	50 mg.	623	52·16	,, ,, 91 ,,	Local tuberculosis.
		,, ,,	,,	,,	637	42·18	,, ,, 91 ,,	
H 44. "D.C."	Cervical glands.	Human cervical glands, direct.	5 months	50 mg.	705	52·16	,, ,, 90 ,,	Slight tuberculosis.
		,, ,,	,,	,,	731	46·70	,, ,, 90 ,,	
H 58. "F.G."	Cervical glands.	Human cervical gland, through G.P. 1816.	2 months	80 mg.	1075	47·15	,, ,, 94 ,,	Local tuberculosis.
		Human lung, through G.P. 1812.	1 month	50 mg.	985	92·50	,, ,, 96 ,,	Slight tuberculosis.

50 MG. CULTURE INJECTIONS INTO CALVES—*continued.*

Class I. Virulent Viruses.

Subcutaneous.

Dose : 50 milligrammes or more.

Virus.	Probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of animal.	Weight in kilos.	Result. Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
Origin of Virus : Human Tuberculosis, believed to be Primary in Cervical and Mesenteric Glands.								
H 38. "J.M."	Cervical and mesenteric glands.	Human cervical glands, through G.P. 793.	14 months	50 mg.	**643**	47·60	Died after 28 days	General tuberculosis, severe.
		,, ,,	,,	,,	**647**	47·60	,, ,, 32 ,,	
		,, ,,	22 months	23 mg.	**887**	46·25	Dying ,, 33 ,,	
Origin of Virus : Human Tuberculosis, believed to be Primary in Mesenteric Glands.								
H 7. "C.M."	Mesenteric glands	Calf 5, through G.P 448.	20 months	50 mg.	**563**	127·91	Killed when very ill after 32 days	General tuberculosis, severe.
		,, ,	25 months	,,	**773**	50·34	Dying ,, 40 ,,	
		,, ,,	,,	,,	**775**	46·70	,, ,, 47 ,,	
H 10. "B.S"	Mesenteric glands	Calf 113, through G.P. 757.	8 months	50 mg.	**387**	100·70	Dying ,, 34 ,,	General tuberculosis, severe.
		,, ,,	16½ months	,,	**667**	44·90	Killed when well ,, 90 ,,	General tuberculosis, slight.
H 14. "F.S."	Mesenteric glands	Human mesenteric glands, through G.P. 587	16 months	50 mg.	**545**	75·29	Died ,, 45 ,,	General tuberculosis, severe.
		,, ,,	19 months	,,	**671**	60·31	,, ,, 33 ,,	
		,, ,,	2 yrs. 3 mos.	,,	**899**	50·80	,, ,, 44 ,,	
H 19. "S.W."	Mesenteric glands	Heifer 239, direct	10 months	50 mg.	**577**	48·50	Died ,, 37 ,,	General tuberculosis, severe.
		,, ,,	,,	,,	**597**	49·89	Dying ,, 45 ,,	
		Goat 11, direct	1 yr. 6 mos.	,,	**885**	45·35	Died ,, 25 ,,	

50 MG. CULTURE INJECTIONS INTO CALVES—*continued.*

CLASS II.—Slightly Virulent Viruses.

SUBCUTANEOUS.

Dose : 50 milligrammes or more.

Virus.	Probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of animal.	Weight in kilos.	Result. Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
Origin of Virus : Human Tuberculosis, believed to be Primary in Cervical and Mesenteric Glands.								
H 55. "R.D."	Cervical and mesenteric glands	Human mesenteric glands, direct	3 months	50 mg.	**937**	46·25	Killed when well after 92 days	Local tuberculosis.
		„ „	„	„	**943**	46·70	„ „ 92 „	Local tuberculosis.
H 63. "G.R."	Cervical and mesenteric glands	Human cervical glands, direct	8 weeks	50 mg.	**1,047**	40·36	Killed when in poor health „ 96 „	Slight tuberculosis.
		Human mesenteric glands, direct	8 weeks	47·5 mg.	**1,021**	42·63	Killed when well „ 96 „	Local tuberculosis.
		Human brain, through G.P. 1877	6 weeks	100 mg.	**1,073**	42·63	„ „ 91 „	Slight tuberculosis.
Origin of Virus : Human Tuberculosis, believed to be Primary in Mesenteric Glands.								
H 8. "S.C."	Mesenteric glands	Human mesenteric glands, direct	27½ months	50 mg.	**657**	53·97	Killed when well after 91 days	Slight tuberculosis.
		„ „	„	„	**673**	51·71	„ „ 91 „	Slight tuberculosis.
H 12. "H.N."	Mesenteric glands	Calf 363, direct	6 months	50 mg.	**619**	43·99	Dying* „ 83 „	Slight tuberculosis.
		„ „	„	„	**635**	35·38	Killed when well „ 90 „	Local tuberculosis.
H 18. "T.T."	Mesenteric glands	Calf 405, direct	8½ months	50 mg.	**645**	50·80	„ „ 90 „	Slight tuberculosis.
		„ „	„	„	**683**	58·06	„ „ 90 „	Local tuberculosis.
H 30. "E.M."	Mesenteric glands	Human bronchial and mesenteric glands, through G.P. 1337	4½ months	50 mg.	**593**	69·84	„ „ 88 „	Slight tuberculosis.
		„ „	„	„	**599**	63·95	„ „ 88 „	Local tuberculosis.
		Inoculation with Glycerin-broth Culture.						
H 8. "S.C."	Mesenteric glands	Human mesenteric glands, direct	8 months	3000 mg.	**175**	57·6	Killed when well after 108 days	Local tuberculosis.
		„ „	„	„	**177**	56·24	„ „ 50 „	Local tuberculosis.

* Death due to pneumonia.

50 MG. CULTURE INJECTIONS INTO CALVES—*continued.*

Class I.—Virulent Viruses.

Subcutaneous.

Dose: 50 milligrammes or more.

Virus.	Probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of animal.	Weight in kilos.	Result. Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
H 20. "F.L."	Mesenteric glands	Calf 213, direct	8 months	50 mg.	**547**	70·29	Died after 36 days	General tuberculosis, severe.
		„ „	„	„	**561**	67·10	„ „ 33 „	
H 32. "Y.W."	Mesenteric glands	Human mesenteric glands direct	3 months	50 mg.	**587**	57·15	„ „ 35 „	General tuberculosis, severe.
		„ „	„	„	**589**	55·34	„ „ 40 „	
		Human bronchial glands through Rabbit 166	6 months	„	**837**	41·72	„ „ 33 „	
		„ „	„	„	**849**	45·35	„ „ 23 „	
H 49. "T.C."*	Mesenteric glands	Human mesenteric glands direct	2 months	50 mg.	**787**	44·90	„ „ 81 „	General tuberculosis, moderate.
		„ „	„	„	**797**	44·90	Killed when well „ 83 „	Slight tuberculosis.
		„ „	7 months	„	**957**	44·90	Died „ 61 „	General tuberculosis, moderate.
		„ „	„	„	**959**	42·18	„ „ 53 „	General tuberculosis, severe.
H 59. "L.B."	Mesenteric glands	Human mesenteric glands, through G.P. 1849	2 months	50 mg.	**1,063**	32·66	„ „ 28 „	General tuberculosis, severe.
		Human lung direct	1½ months	„	**965**	106·12	Dying „ 60 „	General tuberculosis, moderate.
H 64. "M.G."	Mesenteric glands	Human mesenteric glands, through G.P. 1910	2 months	50 mg.	**1,115**	42·63	Died „ 38 „	General tuberculosis, severe.
		Human meninges, through G.P. 1880	„	45 mg.	**1,091**	50·80	Dying „ 37 „	
H 65. "K.B."	Mesenteric glands	Human mesenteric glands, through G.P. 1835	3⅔ months	50 mg.	**1,093**	53·97	Died „ 30 „	General tuberculosis, severe.
		Two older animals inoculated with Cultures from "Primary Mesenteric" Viruses.						
H 7. "C.M."	Mesenteric glands	Calf 5, through G.P. 448	20 months	50 mg.	**B 525**	189·15	Killed when well „ 90 days	General tuberculosis, slight.
H 10. "B.S."	Mesenteric glands	Calf 113, through G.P. 757	8 months	50 mg.	**H 249**	272·2	Killed when very ill „ 54 „	General tuberculosis, severe.

* This virus increased in virulence after passage through Calves.

50 MG. CULTURE INJECTIONS INTO CALVES—*continued.*

CLASS II.—Slightly Virulent Viruses.

SUBCUTANEOUS.

Dose : 50 milligrammes or more.

Virus.	Probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of animal.	Weight in kilos.	Result. Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
H 36. "M.D." -	Mesenteric glands	Human mesenteric glands, direct	3 months	50 mg.	**687**	47·60	Killed when well. after 90 days	Slight tuberculosis.
		" "	"	"	**735**	46·70	" " 91 "	Local tuberculosis.
H 57. "B.J." -	Mesenteric glands	Human mesenteric glands, through G.P. 1802	11 weeks	50 mg.	**981**	116·13	" " 97 "	Slight tuberculosis.
		Human lung, through G.P. 1800	3½ months	"	**1,065**	46·25	" " 93 "	

50 MG. CULTURE INJECTIONS INTO CALVES *–continued.*

Class I.—Virulent Viruses.

Subcutaneous.

Dose : 50 milligrammes or more.

Virus.	Probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of animal.	Weight in kilos.	Result. Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
Origin of Virus : Human Tuberculosis believed to be Primary in Joints.								

50 MG. CULTURE INJECTIONS INTO CALVES—*continued.*

Class II.—Slightly Virulent Viruses.

Subcutaneous.

Dose : 50 milligrammes or more.

Virus.	Probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of animal.	Weight in kilos.	Result. Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
Origin of Virus: Human Tuberculosis believed to be Primary in Joints.								
H 9 "C.T."	Wrist joint.	Calf 201, through G.P. 1081.	10½ months	50 mg.	**733**	50·80	Killed when well after 88 days	Slight tuberculosis.
		„ „	„	„	**737**	53·06	„ „ 87 „	
H 11. "E.D."	Elbow joint.	Calf 309, through G.P. 1298.	8½ months	„	**719**	49·40	„ „ 90 „	Local tuberculosis.
		„ „	„	„	**723**	44·90	„ „ 90 „	Slight tuberculosis.
H 15. "I.W."	Ankle joint.	Calf 413, direct	9 months	„	**745**	46·70	„ „ 91 „	Local tuberculosis.
		„ „	„	„	**771**	46·70	„ „ 91 „	
H 16. "J.H."*	Knee joint.	Human synovial membrane, through G.P. 609.*	14 months	„	**527**	69·39	„ „ 90 „	Slight tuberculosis.
		„ „	„	„	**549**	70·76	„ „ 89 „	Local tuberculosis.
H 41. "A.S."	Knee joint.	Human synovial membrane, through G.P. 1435.	2½ months	„	**699**	51·71	„ „ 89 „	Local tuberculosis.
		„ „	„	„	**713**	47·60	„ „ 89 „	
H 42 "M.R."	Ankle joint.	Human synovial membrane, etc., through G.P. 1447.	3 months	„	**695**	47·15	„ „ 89 „	Local tuberculosis.
		„ „	„	„	**707**	52·16	„ „ 89 „	
H 43. "F.F."	Knee joint.	Human synovial membrane, direct.	5 months	„	**701**	45·80	„ „ 89 „	Local tuberculosis.
		„ „	„	„	**703**	51·71	„ „ 89 „	
H 46. "H.W."	Knee joint	Caseous material from human patella, through G.P. 1444.	3½ months	„	**767**	57·60	„ „ 25† „	Slight tuberculosis.
		„ „	„	„	**777**	52·61	„ „ 90 „	
Inoculation with a Glycerin-broth Culture.								
H 9. "C.T."	Wrist joint.	Disease human tissues, through G.P. 462.	4½ months	750 mg.	**185**	72·11	Killed when in fair health after 40 days	Slight tuberculosis.
		„ „	„	„	**183**	70·29	Killed when well „ 106 „	

* This virus increased in virulence after passage through Calves.

† Killed in order to determine the extent of the distribution and number of T.B. in the tissues and organs of Calves shortly after their inoculation with a virus of low virulence, and to seek for possible transient lesions which leave no trace to be found later. *See* Report on "Minute Non-progressive Tubercles," Vol. III.

50 MG. CULURE INJECTIONS INTO CALVES—*continued.*

Class I.—Virulent Viruses.

Subcutaneous.

Dose : 50 milligrammes or more.

Virus.	Probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milli-grammes.	Number of animal.	Weight in kilos.	Result. Fate of animal and condition at death.	Amount and range of tuberculous lesions at death
Origin of Virus: Human Tuberculosis, believed to be Primary in Kidney.								
Origin of Virus: Human Tuberculosis, believed to be Primary in Testicle.								

50 MG. CULTURE INJECTIONS INTO CALVES—*continued.*

CLASS II.—Slightly Virulent Viruses.

SUBCUTANEOUS.

Dose : 50 milligrammes or more.

Virus.	Probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of animal.	Weight in kilos.	Result. Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
H 47. "S.B."	Hip joint	Diseased human tissues, through G.P. 1430.	4½ months	50 mg.	**791**	59·41	Killed when well after 89 days	Local tuberculosis.
		" "	"	"	**803**	59·86	" " 89 "	Slight tuberculosis.
H 66. "W.C."	Lumbar vertebrae.	Discharge from lumbar abscess, through G.P. 1911.	6 weeks	"	**1,079**	66·20	" " 100 "	Slight tuberculosis.
		" "	"	"	**1,095**	59·41	" " 91 "	Local tuberculosis.
		Origin of Virus: Human Tuberculosis, believed to be Primary in Kidney.						
H 26. "K.M."	Kidney	Human kidney, through G.P. 1,326.	11 months	50 mg.	**865**	43·54	Killed when well after 93 days	Slight tuberculosis.
		" "	"	"	**871**	46·70	" " 91 "	
		Origin of Virus: Human Tuberculosis, believed to be Primary in Testicle.						
H 40. "J.G."	Testicle	Human testicle, through G.P. 1,439.	1½ months	50 mg.	**641**	49·40	Killed when well after 90 days	Local tuberculosis.
		" "	"	"	**651**	41·27	Dying* " 61 "	

* Cause of death undetermined.

10 MG. CULTURE INJECTIONS INTO CALVES.

Virulent Viruses only.

Made to ascertain the relative virulence of the viruses virulent for bovines.

SUBCUTANEOUS.

Dose : 10 Milligrammes.

Virus.	Probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Number of animal.	Weight in kilos.	Result. Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
H 2. Sp. "A."	Lung	Calf 93, through G.P. 534.	2 years 3 months.	**883**	50·34	Killed after 90 days when well	General tuberculosis, slight.
		" "	"	**889**	53·97	Died " 53 "	General tuberculosis, severe.
H 28. "C.L."	Cervical glands.	Human cervical glands, direct.	13 months	**813**	40·82	" " 39 "	General tuberculosis, severe.
		" "	"	**815**	45·35	Dying " 48 "	
		Human cervical glands, through Rabbit 102.	14½ months	**877**	53·97	" " 37* "	
		" "	"	**863**	64·40	Killed when well " 90 "	General tuberculosis, slight.
		" "	"	**819**	55·79	Died " 52 "	General tuberculosis, severe.
		" "	,	**875**	61·22	Killed when well " 91 "	Slight tuberculosis.
H 29. "M.F."	Cervical glands.	Human cervical glands, through G.P. 1,329	11 months	**835**	41·72	Died " 40 "	General tuberculosis, severe.
		" "	"	**839**	46·25	Dying " 69 "	
H 31. "L.F."	Cervical glands.	Human cervical glands, direct.	14 months	**939**	53·06	Died " 43 "	General tuberculosis, severe.
		" "	"	**94**	54·87	" " 72 "	General tuberculosis, moderate.
H 38. "J.M."	Cervical and mesenteric glands.	Human cervical glands, through G.P. 1793.	19½ months	**827**	46·25	Killed when well " 108 "	General tuberculosis, slight.
		" "	"	**845**	41·72	Dying " 36 "	General tuberculosis, severe.
H 7. "C.M."	Mesenteric glands.	Calf 5, through G.P. 448.	3 years	**1,029**	51·70	Killed when well " 90 "	General tuberculosis, slight.
		" "	"	**1,041**	50·80	Died " 41 "	General tuberculosis, severe.
H 10. "B.S."	Mesenteric glands.	Calf 35, through G.P. 725.	2¼ years	**967**	77·10	Dying " 48 "	General tuberculosis, moderate.
		" "	"	**969**	60·77	" " 48 "	

* Death probably hastened by obstruction of ureters by calculi.

10 MG. CULTURE INJECTIONS INTO CALVES—*continued.*

Virus.	Probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Number of animal.	Weight in kilos.	Result. Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
H 14. "F.S."	Mesenteric glands.	Human mesenteric glands, through G.P. 587.	2 years, 3 months.	**893**	52·61	Died after 47 days	General tuberculosis, severe.
		,, ,,	,,	**895**	44·90	Killed when in fair health ,, 90 ,,	General tuberculosis, moderate.
H 19. "S.W."	Mesenteric glands.	Goat 11, direct	1 year, 6 months.	**913**	53·06	Killed when well ,, 90 ,,	General tuberculosis, slight.
		,, ,,	,,	**921**	47·60	Died ,, 48 ,,	General tuberculosis, severe.
H 20. "F.L."	Mesenteric glands.	Calf 213, direct	17 months	**867**	51·70	Killed when well ,, 90 ,,	Slight tuberculosis.
		,, ,,	,,	**879**	53·06	Dying ,, 36 ,,	General tuberculosis, severe.
H 32. "Y.W."	Mesenteric glands.	Human bronchial glands, through Rabbit 166.	6 months	**851**	50·80	Died ,, 47 ,,	General tuberculosis, severe.
		,, ,,	,,	**855**	46·70	,, ,, 34 ,,	General tuberculosis, moderate.
H 49. "T.C." *	Mesenteric glands.	Human mesenteric glands, direct.	7 months	**945**	48·95	Killed when well ,, 96 ,,	General tuberculosis, slight.
		,, ,,	,,	**953**	44·90	Died ,, 108 ,,	General tuberculosis, moderate.
H 59. "L.B."	Mesenteric glands.	Human mesenteric glands, through G.P. 1,849.	2 months	**1,077**	43·54	,, ,, 31 ,,	
		Human cervical glands, direct.	,,	**1,037**	61·22	,, ,, 41 ,,	General tuberculosis, severe.
		Human lung, direct.	1½ months	**987**	103·86	Dying ,, 49 ,,	
		,, ,,	,,	**991**	97·00	Killed when well ,, 94 ,,	Slight tuberculosis.
		Human brain, through G.P. 1,860.	2 months	**1,057**	53·06	Died ,, 31 ,,	General tuberculosis, severe.
H 64. "M.G."	Mesenteric glands.	Human mesenteric glands, through G.P. 1,910.	2 months	**1,111**	48·95	Dying ,, 60 ,,	General tuberculosis, severe.
		,, ,,	,,	**1,113**	44·44	Killed when well ,, 86 ,,	General tuberculosis, slight.
		Human meninges, through G.P. 1,880.	4½ months	**1,105**	50·80	Dying ,, 57 ,,	General tuberculosis, severe.
		,, ,,	,,	**1,123**	35·83	Killed when in poor health. ,, 77 ,,	General tuberculosis, moderate.
H 65. "K.B."	Mesenteric glands.	Human mesenteric glands, through G.P. 1,835.	3⅔ months	**1,085**	56·69	Dying ,, 51 ,,	General tuberculosis, severe.
		,, ,,	,,	**1,089**	54·42	Died ,, 38 ,,	

* This virus increased in virulence after passage through calves.

CULTURE INJECTIONS INTO CALVES—*continued.*

CLASS III.—Virus not susceptible of being placed either in Class I. or Class II.

Origin of Virus: Human Tuberculosis believed to be Primary in Skin [LUPUS].

CALVES. *Subcutaneous Injections.*

Virus.	Immediate Source of Culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Calf.	Weight in kilos.	Result. Fate of Animal and condition at death.	Amount and Range of Tuberculous Lesions at death.
			Dose: 50 *milligrammes.*				
H 53. "D.H."	Human tissues, through G.P. 1482.	8½ months	50 mg.	**905**	64·40	Killed when well after 91 days	General tuberculosis, slight.
	,, ,,	14½ months	,,	**977**	96·55	,, ,, 90 ,,	Slight tuberculosis.
	,, ,,	,,	,,	**1001**	71·21	,, ,, 91 ,,	
	Calf 905, direct -	2½ months	,,	**979**	83·91	,, ,, 103 ,,	Local tuberculosis.
	,, ,,	,,	,,	**993**	97·45	,, ,, 88 ,,	General tuberculosis, slight.
			Dose: 10 *milligrammes.*				
	Calf 905, direct -	2½ months	10 mg.	**973**	107·94	,, ,, 88 ,,	Slight tuberculosis.
	,, ,,	,,	,,	**975**	109·75	,, ,, 88 ,,	General tuberculosis, slight.

FEEDING EXPERIMENTS ON BOVINES.

Class II.—Slightly Virulent Viruses.

Virus.	Probable primary seat of disease.	Immediate source of material used for experiment.	Date of feeding: Quantity received: Duration of experiment.	No. of bovine.	Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
H 1. "A.M." -	Lung	Cow 1	Sucking this cow from 1st May, 1902, to 15th November, 1902 [198 days].	**Calf 19**	Killed after 198 days when well	One mesenteric gland caseo-calcareous.
,, ,, -	,,	Cow 3	Sucking this cow from 1st May, 1902, to 2nd July, 1902 [62 days].	**Calf 21**	,, ,, 226 ,,	Numerous caseo-calcareous nodules in mesenteric glands.
,, ,, -	,,	Cow 43	Sucking this cow from 3rd July, 1902, to 23rd December, 1902 [173 days].	**Calf 53**	,, ,, 173 ,,	Four mesenteric glands contained caseo-calcareous patches.
H 4. "M.L." -	,,	Cow 49	Sucking this cow from 29th July, 1902, to 3rd April, 1903 [248 days].	**Calf 51**	,, ,, 248 ,,	One mesenteric gland contained a calcareous nodule.
H 6. "U.H." -	Mesenteric glands	Cow 87	Sucking this cow from 4th November, 1902, to 30th March, 1903 [146 days].	**Calf 57**	,, ,, 146 ,,	One pharyngeal and four mesenteric glands contained calcareous nodules or foci.

Two Heifers and Five Calves Fed with Human Sputum.

Virus.	Probable primary seat of disease.	Immediate source of material used for experiment.	Date of feeding: Quantity received: Duration of experiment.	No. of bovine.	Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
H 2. "Sp.A." *	Lungs	Human sputum from many patients.	Fed for seven months, almost daily, commencing 8th May, 1902.	**Heifer 11**	Killed after 209 days when well	Five mesenteric and three hepatic glands contained caseo-calcareous nodules: Pedunculated growth on lung.
	,,		Fed almost daily for eight months, commencing 8th May, 1902.	**Heifer 13**	,, ,, 303 ,,	Nine mesenteric glands contained calcareous foci.
	,,		This calf was sucking from H. 13, while the latter was being fed with sputum. (Eight G.P.'s inoculated with the milk remained healthy.) The calf was noticed to feed from its mother's sputum pail.	**Calf 99**	,, ,, 271 ,,	Normal throughout.
H 17. "Sp.B." -	Lungs	Human sputum from many patients	Fed almost daily from 24th June, 1903, to 23rd September, 1903 [91 days].	**Calf 161**	Killed after 125 days when well	Pharyngeal and mesenteric glands contained calcareous foci. Several nodules in ileum. Minute calcareous focus in posterior thoracic gland.
	,,		Fed almost daily from 24th June, 1903, to 22nd October, 1903 [120 days].	**Calf 167**	,, ,, 168 ,,	About one-third of the mesenteric glands contained few minute calcareous foci: one focus occurred also in a pharyngeal gland.
	,,	,,	,,	**Calf 169**	,, ,, 169 ,,	About one-third of the mesenteric glands contained few minute calcareous foci: many small tubercles in intestine: calcareous nodules in pharyngeal glands.
	,,	,,	,,	**Calf 171**	,, ,, 154 ,,	Coeliac and many mesenteric glands contained numerous minute calcareous foci.

* The result of the large injections experiment, which was carried on from the lesions of these heifers, proved that the sputum contained bacilli belonging to Group I., probably in relatively small numbers, as well as bacilli of Group II., but as the effect of these virulent bacilli did not clearly appear in the animals fed with the sputum, they are placed among the animals injected with Group II.

FEEDING EXPERIMENTS ON BOVINES.—*continued.*

CLASS I.—Virulent Viruses.

Virus.	Probable primary seat of disease.	Source of material used for experiment.	Date of feeding: Quantity received: Duration of experiment.	No. of bovine.	Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
H 7. "C.M." -	Mesenteric glands	Cow 73	Sucking this cow from 12th November, 1902, to 6th May, 1903 [170 days].	Calf 9	Killed after 172 days when well	Three mesenteric glands contained calcareous foci.
H 14. "F.S." -	Mesenteric glands	Cow 75	Sucking this cow from 2nd July, 1903, to 4th August, 1903 [33 days].	Calf 181	Killed „ 114 „ when in fair health	Numerous ulcers in intestine; caseation of all mesenteric glands. One or more tubercles in liver, spleen, lungs, omentum, cervical and thoracic glands.
H 2. "Sp.A." -	Lungs	Calf 163	Fed with 200 cc. of an emulsion of prescapular gland and local lesion from this calf on 14th August, 1903.	Calf 173	Killed „ 69 „ when well	Two tuberculous nodules in two mesenteric glands.

THE VIRULENCE OF TUBERCLE BACILLI OF HUMAN ORIGIN FOR THE RABBIT.

THE VIRULENCE OF TUBERCLE BACILLI OF HUMAN ORIGIN FOR THE RABBIT.

The usual practice here was to inject rabbits in the peritoneal cavity, subcutaneous injection being found to produce tuberculosis far less rapidly, and to result in the formation of an ulcer in the skin at the seat of inoculation. The latter was considered objectionable on account of the opportunity it afforded for the escape of tubercle bacilli.

For the differentiation of our viruses according to their comparative virulence the rabbit proved only less useful than the ox. To the viruses of Group I. it proved very susceptible, and with moderate doses of culture (*e.g.*, 1·0 or 0·1 mg.) it invariably succumbed to tuberculosis within a few weeks, sometimes in less than a fortnight. Even with smaller doses it never failed to develop fatal tuberculosis, though after a longer interval; and a special series of experiments has shown that even very minute doses, such as one hundred thousandth, or one millionth of a milligramme, injected either intraperitoneally or subcutaneously, surely produce progressive tuberculosis in this animal. In this respect the rabbit differs strikingly from the calf, which is able to resist a comparatively large dose of bacilli belonging to Group I., and to recover completely.

While the rabbit is less able to resist tubercle bacilli of Group I. than the calf, it shows somewhat less resistance to bacilli of Group II. also. In exceptional cases very large doses, such as 50 mg. or even occasionally 10 mg. of culture injected intraperitoneally, have proved fatal. But in such cases death occurs early; and the rule is either early death or complete recovery, and recovery is by far the more common result. In very rare cases chronic progressive tuberculosis occurs, and may end fatally after a year or more with the formation of small cavities in the lungs. (See Rabbits Nos. 260, 640.) Rarely the joints (Rabbit 263, 271, 539) or the spinal column (Rabbit 659) become tuberculous.

With more moderate doses of bacilli of Group II., such for example as 1 mg. of culture, tuberculous lesions are more widely distributed in the rabbit than in the calf. After an intraperitoneal injection the injected matter, especially if it be a tissue emulsion, may be found in a soft caseous state, encysted in a thin membrane, and loosely attached to the cæcum, the pelvic viscera, or omentum. In rare cases large fibro-necrotic tumours have been found in the abdomen (Rabbit 271). A greater or less number of small translucent tubercles, often with calcareous centres, are almost invariably seen in the omentum, and often in the meso-colon and mesentery. In the dorsal layer of the omentum are yellow calcareous nodules and streaks, doubtless following the lines of the lymphatics. Fibrous tags and nodules with yellow centres are not uncommon on the peritoneal surface of the diaphragm, and attached to the surface of the liver or spleen. Tubercles in the substance of the liver and spleen are almost unknown after injections of bacilli of Group II., but have been seen in one instance (Rabbit 665). Some degree of tuberculosis of lungs and kidneys is common. The former often contain small numbers of little translucent tubercles with yellow centres, or irregular grey fibrous nodules, especially at their margins and in their caudal extremities. These often contain little caseous foci, and in the rare instances, already alluded to, in which chronic tuberculosis continues to progress, these enlarge, run together and soften, and may even form little cavities. The kidneys may contain a few small fibrous tubercles, or may be studded with larger nodules, which form whitish elevations, sometimes as much as $\frac{1}{4}$ of an inch in diameter, on their surfaces, and penetrate like wedges into the cortex. In yet other cases small tubercles appear in the zone between the cortex and medulla and send yellow streaks into the latter. In such it is not uncommon to find the pelvis or some of the calyces distended with muco-purulent matter, rich in tubercle bacilli. After intraperitoneal injection the uterus has not unfrequently been found filled and swollen with a substance closely resembling thin pus, and containing numerous bacilli.

In spite of the fact that tuberculous disease in the rabbit infected with a virus belonging to the human Group II. is often widely spread, the peritoneum, lungs and kidneys being commonly more or less affected, yet as a rule these animals remain well and grow large and fat, and the functional activity of their organs does not seem to be seriously deranged. Thus there is a very real difference in the way the rabbit reacts to the two groups of human tubercle bacilli, and the difference is striking to those who see the one lot invariably die, and the other as a rule live to be large, well grown, and fat animals. Yet the widespread distribution of the lesions, for the most part trivial, in those which receive injections of bacilli of Group II. makes this difference appear less striking on paper, and the variety of the lesions makes them less easily classified. In the tables, therefore, no attempt is made to express the results by means of symbols, as in the case of the calves, but short summaries of the post-mortem examinations are given instead.

TISSUE EMULSION INJECTIONS INTO RABBITS.

TISSUE EMULSION INJECTIONS INTO RABBITS.

Class I.—Virulent Viruses.

Virus.	Source of tissue emulsion.	Number of Rabbit.	Mode of injection.	Estimated dose of tubercle bacilli and volume of emulsion.	Weight in grammes.		Killed or died.	Duration of life.	Result.
					Initial.	Final.			
Human Tuberculosis, believed to be Primary in Lung.									

TISSUE EMULSION INJECTIONS INTO RABBITS.

Class II.—Slightly Virulent Viruses.

Virus.	Source of tissue emulsion.	Number of Rabbit.	Mode of injection.	Estimated dose of tubercle bacilli and volume of emulsion.	Weight in grammes.		Killed or died.	Duration of life.	Result.
					Initial.	Final.			
				Human Tuberculosis, believed to be Primary in Lung.					
H 17. "Sp.B."	Calf 161	**11**	Intrap.	—	2,370	3,710	Killed	175 days	No tuberculosis.
		12	Subcut.	—	2,840	3,410	,,	175 ,,	No lesion at seat of inoculation. Inguinal glands could not be found. (No tuberculosis.)
	Calf 169	**26**	Intrap.	—	840	640	Died	11 ,,	Slight tuberculous peritonitis. Large tuberculous abscess, composed of purulent caseous material, in peritoneum. No tuberculosis elsewhere.
		27	Subcut.	—	940	4,230	Killed	170 ,,	No definite lesion at seat of inoculation. Inguinal glands normal. Few small translucent tubercles were seen in lungs. No tuberculosis elsewhere.
	Calf 169 through G.P. 1023.	**53**	Intrap.	(2 cc.)	2,800	3,120	Died	22 ,,	Acute peritonitis.
	Calf 339 through G.P. 1235.	**108**	,,	20,848,000 (4 cc.)	1,250	2,360	Killed	77 ,,	Slight tuberculous peritonitis. A few minute tubercles in kidneys. A good many grey translucent tubercles, without central caseation, in lungs.
		109	Intrav.	10,424,000 (2 cc.)	1,300	1,220	,,	77 ,,	A few minute dark grey tubercles in lungs. Few small tubercles in kidneys and liver.
	Calf 171	**17**	Intrap.	—	750	650	Died	5 ,,	Psorospermosis.
		18	Subcut.	—	690	700	,,	16 ,,	No tuberculosis. Cause of death not determined.
	Calf 277	**52**	Intrap.	52,500 (1·5 cc.)	1,550	3,000	Killed	95 ,,	Few minute translucent tubercles in omentum. Peritoneum normal. Lungs contained a few grey translucent tubercles with yellow centres. No tuberculosis elsewhere.
	Calf 167	**24**	,,	—	1,020		Died	1 ,,	No sign of peritonitis. Death apparently due to toxæmia.
		25	Subcut.	—	960	—	,,	1 ,,	Ditto.
	Calf 167 through G.P. 1133.	**76**	Intrap.	4,160,000 (2 cc.)	1,970	3,120	Killed	130 ,,	Several soft cream-coloured patches were seen attached to the outer surface of the muscular wall on removing the skin of the abdomen. Inguinal glands normal. Peritoneum normal. Each kidney contained a large wedge-shaped tubercle, translucent, with yellow points, and also several smaller ones. In the pelvis and calyces of the right was some curdy material. One shot-sized tubercle with an opaque centre was seen in the lungs.
		77	Intrav.	4,160,000 (2 cc.)	1,800	2,330	,,	130 ,,	One minute grey focus was seen in each lung. There was a cream-coloured spot in a similar situation to those described in No. 76 (? an infection of the scattered elements of the undeveloped mammary gland).
	Calf 391	**89**	,,	13,645,000 (2 cc.)	2,840	3,670	,,	93 ,,	Few minute grey tubercles in lungs. There was one wedge-shaped tubercle of the usual type in the left kidney, and one or two yellow tubercles in the peritoneum covering it. No tuberculosis elsewhere.
		90	Intrap.	13,645,000 (2 cc.)	970	3,050	,,	93 ,,	One minute translucent grey tubercle in left lung only.

TISSUE EMULSION INJECTIONS INTO RABBITS—*continued.*

CLASS I.—Virulent Viruses.

Virus.	Source of tissue emulsion.	Number of Rabbit.	Mode of injection.	Estimated dose of tubercle bacilli and volume of emulsion.	Weight in grammes.		Killed or died.	Duration of life.	Result.
					Initial.	Final.			

TISSUE EMULSION INJECTIONS INTO RABBITS—*continued.*

CLASS II.—Slightly Virulent Viruses.

Virus.	Source of tissue emulsion.	Number of Rabbit.	Mode of injection.	Estimated dose of tubercle bacilli and volume of emulsion.	Weight in grammes.		Killed or died.	Duration of life.	Result.
					Initial.	Final.			
H 17. "Sp.B." —*continued.*	Goat 39	**127**	Intrav.	427,000 (2 cc.)	1,840	2,750	Died	66 days	Septic peritonitis. No tuberculosis.
		128	Intrap.	2,134,000 (10 cc.)	1,705	3,000	Killed	119 ,,	The injected material was found encysted in the omentum. Peritoneum normal. All organs normal.
	Calf 685	**380**	,,	(15 cc.) Very few T.B.	1,020	3,530	,,	191 ,,	No tuberculosis.
H 22. "F.W."	Human lung	**22**	Intrap.	1,140,000 (2 cc.)	930	2,530	Killed	94 ,,	Slight tuberculous peritonitis. One small tubercle in spleen. Lungs were thickly studded with tubercles, greyish in colour, and there were some areas of solidification.
	Human thoracic gland	**23**	,,	18,000 (1·5 cc.)	900	900	Died	4 ,,	Acute peritonitis.
	Calf 293	**56**	,,	213,000 (2 cc.)	2,050	2,850	Killed	119 ,,	A few yellow grains were here and there attached to the peritoneum and omentum ; these appeared to be encysted portions of the injected material. One or two (?) tubercles were seen in kidneys and liver. There were three or four collections of solid nodules in each lung, $\frac{1}{2}$–$\frac{3}{4}$ in. in diameter, translucent, with caseating foci.
		57	Intrav.	213,000 (2 cc.)	2,540	3,200	,,	119 ,,	In the lungs were several irregular islands and a number of smaller foci, composed of reddish-grey tough tissue, with a few small caseating points. One tubercle in right kidney and one in liver.
	Calf 291 through G.P. 1200	**81**	Intrap.	53,980,000 (1·5 cc.)	1,600	—	,,	114 ,,	Tuberculous peritonitis. Spleen, liver, and kidneys normal on section. One or two small fibrous tubercles in lungs.
		82	Intrav.	53,980,000 (1·5 cc.)	1,800	1,070	Died	84 ,,	Lungs appeared normal. A number of tubercles were seen in each kidney, and in the pelves were collections of soft caseous material. There was no tuberculosis elsewhere.
	Calf 399	**98**	Intrap.	20,190,000 (1·5 cc.)	1,050	1,200	,,	51 ,,	There were one or two minute tuberculous foci in the lungs and kidneys. Death due to septic peritonitis.
		99	Intrav.	20,190,000 (1·5 cc.)	1,300	2,000	Killed	65 ,,	Lungs were packed rather thickly in places with small grey translucent tubercles. Kidneys were speckled with small grey tubercles. Numerous yellow foci were seen on the peritoneal surface of the colon.
	Calf 457	**117**	Intrap. and partly subcut.	11,150,000 (5 cc.)	1,300	2,650	,,	91 ,,	In the abdominal wall at the seat of inoculation was a little caseous nodule. There was no tuberculosis elsewhere.
		118	Intrav.	2,230,000 (1 cc.)	1,500	2,610	,,	91 ,,	In each lung were two or three translucent fibrous tubercles up to $\frac{1}{8}$ in. in diameter, some of which were studded with whitish points ; there were also a few smaller ones. One or two small tubercles occurred in right kidney.

TISSUE EMULSION INJECTIONS INTO RABBITS—*continued.*

CLASS I.—Virulent Viruses.

Virus.	Source of tissue emulsion.	Number of Rabbit.	Mode of injection.	Estimated dose of tubercle bacilli and volume of emulsion.	Weight in grammes.		Killed or died.	Duration of life.	Result.
					Initial.	Final.			

TISSUE EMULSION INJECTIONS INTO RABBITS—*continued.*

CLASS II.—Slightly Virulent Viruses.

Virus.	Source of tissue emulsion.	Number of Rabbit.	Mode of injection.	Estimated dose of tubercle bacilli and volume of emulsion.	Weight in grammes.		Killed or died.	Duration of life.	Result.
					Initial.	Final.			
H 22. "F.W." —*continued.*	Calf 749	**427**	Intrap.	10,000,000	1,100	1,850	Killed	88 days	Some translucent tubercles with yellow centres in omentum. Peritoneum normal. Small tubercles in each kidney. Rather numerous translucent patches, containing few minute caseous foci, in lungs.
		428	,,	10,000,000	1,020	1,920	,,	88 ,,	Omentum as in No. 427. Peritoneum normal. A few minute tubercles in each kidney and a few translucent tubercles in lungs.
	Calf 811	**522**	,,	185,600,000 (5 cc.)	1,070	—	,,	39 ,,	Commencing tuberculous peritonitis.
H 23. "J.P."	Human lung	**62**	Intrav.	10,309,000 (1 cc.)	1,970	1,800	Killed	104 ,,	Lungs showed large areas of pinkish-grey tissue, sparsely studded with minute yellow foci. The anterior lobes were almost completely consolidated. Each kidney showed two groups of yellow foci, set in translucent tissue, and penetrating as a wedge into the cortex. The testes and epididymus were tuberculous throughout. There were many tubercles in appendix, cæcum, and lower end of ileum, and the mesenteric glands contained calcareous foci. No definite tubercles were seen in liver or spleen.
		63	Intrap.	10,309,000 (1 cc.)	2,140	3,300	,,	104 ,,	Very slight tuberculous peritonitis. In lungs were several translucent tubercles with minute yellow foci. One kidney showed a single small tubercle.
H 25. "A.T."	Human lung through G.P. 1283	**94**	,,	18,373,000 (4 cc.)	1,590	2,300	Killed	86 ,,	Considerable deposit of caseating tubercle in omentum. Peritoneum normal. One fibrous tubercle in liver. Few grey tubercles, with an occasional minute yellow central opacity, in lungs.
		95	Intrav.	4,593,000 (1 cc.)	1,120	1,900	,,	86 ,,	Few translucent grey tubercles in lungs, without central opacity. The pelves of both kidneys contained muco-purulent material, and in the cortex of each was a single tubercle.
	Calf 449	**120**	Intrap.	1,125,000 (1 cc.)	1,800	2,720	Killed	97 ,,	Several small tubercles on mesocolon; none elsewhere on the peritoneum. All organs normal.
	Bull 551	**517**	,,	83,300,000 (1 cc.)	1,770	4,500	,,	320 ,,	A few yellow calcareous streaks in omentum and elsewhere in peritoneum. Few calcareous foci in mesenteric glands. No tuberculosis elsewhere.
	Calf 831	**537**	,,	88,900,000 (1 cc.)	940	750	Died	3 ,,	Death due to psorospermosis.
		538	,,	88,900,000 (1 cc.)	820	1,870	,,	283 ,,	Some caseous softened collections in omentum. The kidneys were enlarged, their pelves and calyces distended with an enormous quantity of softened caseous matter; the kidney substance was very tough and congested. No tuberculosis elsewhere.

TISSUE EMULSION INJECTIONS INTO RABBITS—*continued.*

CLASS I.—Virulent Viruses.

Virus.	Source of tissue emulsion.	Number of Rabbit.	Mode of injection.	Estimated dose of tubercle bacilli and volume of emulsion.	Weight in grammes.		Killed or died.	Duration of life.	Result.
					Initial.	Final.			
Human Tuberculosis, believed to be primary in Bronchial Glands.									

TISSUE EMULSION INJECTIONS INTO RABBITS—*continued.*

CLASS II.—Slightly Virulent Viruses.

Virus.	Source of tissue emulsion.	Number of Rabbit.	Mode of injection.	Estimated dose of tubercle bacilli and volume of emulsion.	Weight in grammes.		Killed or died.	Duration of life.	Result.
					Initial.	Final.			
H 25. "A.T." —*continued.*	Calf 859	**539**	Intrap.	29,644,000 (1 cc.)	1,170	1,320	Killed	374 days	Some small fibro-calcareous tubercles in omentum. In the right kidney were some caseous striæ, in the left was a single tubercle. Few fibro-caseous nodules in lungs. Tuberculosis of right knee and left ankle joints.
		540	,,	29,644,000 (1 cc.)	1,120	3,370	,,	374 ,,	Few translucent tubercles in omentum and mesocolon. No tuberculosis elsewhere.
H 45. "F.M."	Human bronchial gland	**64**	Intrav.	(1·5 cc.)	1,920	3,270	Killed	158 ,,	One minute translucent tubercle (?) in lung only.
		65	Intrap.	(1· cc.)	1,600	3,450	,,	158 ,,	No tuberculosis.
H 48. "W.P."	Human lung	**301**	Intrap.	(8 cc.) very large dose of T.B.	1,520	910	Died	19 ,,	Slight tuberculous peritonitis. Two small grey tubercles in lungs. Death due to other causes.
H 50. "P.H."	Tubercles from human lung	**261**	Intrap.	(4 cc.)	1,500	2,820	Killed	182 ,,	No tuberculosis in peritoneal cavity except for a group of tubercles on the right horn of the uterus. Beneath was a caseous nodule projecting into the lumen of the organ, which contained some muco-purulent fluid. The left horn of the uterus was pregnant. There were one or two small fibrous tubercles in lungs. No tuberculosis elsewhere.
	Contents of cavity from ditto	**262**	,,	(2 cc.)	1,500	2,400	,,	182 ,,	There were a few small fibrous tubercles with yellow centres in peritoneum, and a few small fibrous tubercles in lungs.
H 51. "H.M."	Human lung	**438**	Intrap.	(1 cc.)	970	2,040	Killed	101 ,,	Scarcely a trace of tuberculosis; a pultaceous mass in the mesocolon and a little grey tubercle in the lung.
		439	,,	(5 cc.)	1,170	1,000	Died	3 ,,	Acute peritonitis.
H 62. "W.M."	Human sputum	**694**	Intrap.	(6 cc.)	1,420	2,500	Killed	108 ,,	Some streaks and foci of caseous deposit in omentum. Peritoneum normal. One or two little tubercles in lungs
				Human Tuberculosis, believed to be Primary in Bronchial Glands.					
H 21. "G.B."	Human bronchial glands.	**20**	Intrap.	15,666 (1 cc.)	700	2,200	Killed	97 days	Slight tuberculous peritonitis. The lungs were thickly studded with raised confluent greyish tubercles. On section the organ was solid in places; the tubercles were seen to have a white opaque centre and translucent margins. No tuberculosis elsewhere.
		21	Subcut.	15,666 (1 cc.)	770	2,030	,,	97 ,,	No tuberculosis.

TISSUE EMULSION INJECTIONS INTO RABBITS—*continued.*

CLASS I.—Virulent Viruses.

Virus.	Source of tissue emulsion.	Number of Rabbit.	Mode of injection.	Estimated dose of tubercle bacilli and volume of emulsion.	Weight in grammes.		Killed or died.	Duration of life.	Result.
					Initial.	Final.			
Human Tuberculosis, believed to be Primary in Cervical Glands.									
H 28. "C.L."	Human cervical glands, through G.P. 1270.	**102**	Intrap.	225,366,000 (5 cc.)	1,170	850	Died	21 days	Very extensive tuberculous peritonitis. Spleen, kidney and liver apparently normal on section. Lungs showed a large number of rather indistinct grey translucent tubercles, confluent and forming large translucent areas in the upper lobes. The bronchial and many other glands contained caseous foci. Diaphragmatic pleura thickly studded with small tubercles. Tubercle bacilli numerous in liver, spleen and rib marrow.
		103	Intrav.	90,146,000 (2 cc.)	1,420	1,270	,,	14 ,,	Lungs were thickly studded with very minute white tubercles ; the right was congested. Abdominal organs appeared normal, but tubercle bacilli were numerous in liver and spleen ; none were found in kidney.
	Calf 515	**123**	Intrap.	19,015,000 (1 cc.)	1,490	1,115	,,	41 ,,	Severe tuberculous peritonitis. Liver packed with small scarcely visible tubercles. Numerous small tubercles on surface of spleen. Few small tubercles in kidneys. Lungs œdematous and almost airless, and packed with tubercles.
		124	Intrav.	19,015,000 (1 cc.)	1,600	1,290	,,	23 ,,	Lungs pale in colour, thickly studded with minute tubercles with opaque centres. Kidneys each showed one or two tubercles. Liver and spleen appeared normal, but tubercle bacilli were numerous in both.
H 29. "M.F."	Human cervical glands, through G.P. 1,329.	**115**	Intrap.	302,040,000 (2 cc.)	1,370	1,840	Killed	54 ,,	Tuberculous peritonitis. Omentum formed the usual large caseating mass. Very numerous tubercles in spleen ; kidneys also contained tubercles. There were tubercles on surface of liver, but none on section. Lungs contained many tubercles, translucent with yellow centres.
		116	Intrav.	151,020,000 (1 cc.)	1,520	650	Died	16 ,,	Lungs were dark pink in colour, barely floated in water, and were closely packed with tubercles. The abdominal organs were free from visible tubercles.
H 31. "L.F."	Human cervical glands.	**147**	Intrap. and partly subcut.	1,993,000 (5 cc.)	1,720	1,220	,,	107 ,,	There were two caseous and softened tumours at the seat of inoculation. The omentum formed a large bunch of yellow tubercles. In the cæcum was a large ulcer with thick caseous walls, and in the mesentery was a large caseous mass. The liver and spleen contained a few tubercles. Large solid pea-sized caseous nodules projected from the surface of each kidney. Lungs were packed with irregular caseating tubercles with translucent margins.
		148	Subcut.	1,993,000 (5 cc.)	1,670	1,320	,,	112 ,,	Large ulcer in right flank. Nearest glands caseous. The lung tissue was almost entirely replaced by large irregular areas of tuberculous deposit, with yellow centres and grey margins. Three minute tubercles in spleen. Liver normal. A large number of tubercles, grey and translucent with yellow centres, projected from the surface of each kidney.

TISSUE EMULSION INJECTIONS INTO RABBITS—*continued.*

CLASS II.—Slightly Virulent Viruses.

Virus.	Source of tissue emulsion.	Number of Rabbit.	Mode of injection.	Estimated dose of tubercle bacilli and volume of emulsion.	Weight in grammes.		Killed or died.	Duration of life.	Result.
					Initial.	Final.			
Human Tuberculosis, believed to be Primary in Cervical Glands.									
H 33. "R.T."	Human axillary glands.	**125**	Intrav.	(2 cc.)	4,070	3,720	Killed	135 days	One shot-sized tubercle in the right lung only.
		126	Intrap.	(10 cc.)	1,520	2,090	Died	63 ,,	Slight tuberculous peritonitis. No tuberculosis elsewhere.
H 37. "O.J."	Human cervical glands through G.P.'s 1360–1361.	**144**	(?) Intrap.	(5 cc.)	2,020	1,570	,,	27 ,,	No sign of tuberculosis in peritoneum or elsewhere. There was a very large foul abscess extending over the ventral surface of the body.
H 39. "M.B."	Human cervical glands.	**178**	Subcut.	(10 cc.)	1,620	2,920	Killed	179 ,,	No tuberculosis.
		179	Intrap.	(10 cc.)	1,550	2,500	,,	179 ,,	Two or three very small yellow collections seen in omentum. No tuberculosis elsewhere.

TISSUE EMULSION INJECTIONS INTO RABBITS—*continued.*

CLASS I.—Virulent Viruses.

Virus.	Source of tissue emulsion.	Number of Rabbit.	Mode of injection.	Estimated dose of tubercle bacilli and volume of emulsion.	Weight in grammes.		Killed or died.	Duration of life.	Result
					Initial.	Final.			
Human Tuberculosis, believed to be Primary in Cervical and Mesenteric Glands.									
Human Tuberculosis, believed to be Primary in Mesenteric Glands.									
H 10. "B.S."	Calf 113	**1**	Intrap.	361,000 (2 cc.)	2,480	2,250	Killed	75 days	Numerous tuberculous nodules in omentum. Extensive tuberculous peritonitis. Numerous small tubercles in substance of liver, and larger ones on surface. Numerous tubercles on surface of spleen, and ramifying whitish patches in its interior. Lungs thickly studded everywhere with tubercles. Numerous tubercles on costal pleura. Bronchial glands caseous.
		2	Subcut.	361,000 (2 cc.)	2,500	—	Killed (dying)	97 ,,	Large local ulcer. Nearest glands caseous. Kidneys thickly studded with large tubercles; moderate number in spleen; few in liver. Lungs packed with tubercles, often confluent. Numerous tubercles on pleura. Bronchial glands caseous.
H 14. "F.S."	Heifer 197	**5**	Intrap.	—	2,470	1,750	Died	53 ,,	Omentum formed a large whitish mass. Peritoneum widely studded with tubercles. Spleen packed with tubercles, some of large size. Liver speckled with minute points, (?) tubercles. Numerous tubercles in kidneys; lungs full of irregular tubercles. Tuberculous plaques on diaphragm.
		6	Subcut.	—	2,470	2,870	Killed	65 ,,	Large dense caseous local tumour. Extensive tuberculous peritonitis. Liver almost normal. Surface of spleen covered with little tubercles. Kidneys show a number of large tubercles, translucent with small caseous centres. Lungs full of tubercles of similar character. Tubercles on pleura. Many glands enlarged and caseous.
	Heifer 235	**54**	Intrap.	(8 cc.)	1,970	2,700	,,	91 ,,	Small collections of caseous material in abdominal wall. Omentum showed a number of small tubercles. Liver and spleen normal. Two or three small tubercles in each kidney. In lungs were a number of translucent tubercles, some with small caseous centres. Bronchial glands normal.
		55	Intrav.	(1 cc.)	2,350	1,450	Died	40 ,,	Lungs just floated in water, and on section appeared as a mass of caseating tubercles. Bronchial glands contained caseous foci. Liver speckled with minute points; spleen large, similar on section. In kidneys were a number of grey translucent tubercles with white centres. Microscopic examination of rib marrow showed tubercle bacilli in large numbers.

TISSUE EMULSION INJECTIONS INTO RABBITS—*continued.*

CLASS II.—Slightly Virulent Viruses.

Virus.	Source of tissue emulsion.	Number of Rabbit.	Mode of injection.	Estimated dose of tubercle bacilli and volume of emulsion.	Weight in grammes. Initial.	Weight in grammes. Final.	Killed or died.	Duration of life.	Result.
Human Tuberculosis, believed to be Primary in Cervical and Mesenteric Glands.									
H 63. "G. R."	Human mesenteric glands	793	Intrap.	—	1,240	1,860	Killed	55 days	On the mesentery and omentum were scattered translucent tubercles with small opaque centres; the omentum was not drawn up or thickened. One or two small tubercles in each kidney. A few dark grey tubercles in lungs.
Human Tuberculosis, believed to be Primary in Mesenteric Glands.									
H 8. "S. C."	Calf 303, through G.P.'s 1204–1205	104	Intrap.	(10 cc.)	1,370	2,470	Killed	83 days	Omentum caseous and partly softened. Few loosely attached nodules on mesocolon. Spleen, liver, and kidneys normal. Few small translucent tubercles in lungs.
		105	Intrav.	(5 cc.)	1,350	2,890	,,	83 ,,	Normal throughout.
	Calf 305	36	Intrap.	5,020,000 (4 cc.)	1,560	2,920	,,	132 ,,	Small collection of caseous material at seat of inoculation. Two small grey tubercles in lungs.
	Calf 275, through G.P.'s 1230–1231	100	Intrav.	(2 cc.)	1,900	2,750	,,	59 ,,	Few small grey tubercles in lungs. Three or four in each kidney. Liver and spleen normal.
		101	Intrap.	(5 cc.)	1,560	2,800	,,	59 ,,	Numerous small tubercles on omentum. One tubercle in right kidney. A moderate number of minute grey tubercles in lungs.
H 12. "H. N."	Calf 189, through G.P.'s 985–988	32	,,	11,552,000 (2 cc.)	1,135	1,240	Died	10 ,,	Septic peritonitis. Volvulus was the apparent cause of death.
		33	Intrav.	11,552,000 (2 cc.)	1,960	1,940	,,	15 ,,	No tuberculosis. Cause of death not determined.
	Calf 319	60	,,	much smaller than 61	2,450	1,770	Killed (when ill)	111 ,,	Lungs very full of minute translucent tubercles, partly confluent; there was no caseation. Several small whitish tubercles in kidneys. Spleen normal. Two small tubercles in liver.
		61	Intrap.	157,000,000 (2 cc.)	1,980	3,500	Killed	111 ,,	Injected material was encysted in the peritoneum. One tubercle seen in liver, two or three in each kidney. One or two doubtful foci in lung.
H 18. "T. T."	Calf 203	15	Intrap.	—	800	3,020	Killed	124 ,,	No tuberculosis, except for three cysts in peritoneum apparently containing injected material.
		16	,,	—	470	3,020	,,	124 ,,	No tuberculosis.
	Calf 131, through G.P.'s 945–489	34	,,	(4 cc.)	1,700	1,910	,,	62 ,,	Large abscess in abdominal wall (no tubercle bacilli seen in the pus). Slight tuberculous peritonitis. Lungs everywhere showed numerous grey tubercles. One tubercle in kidney. Mesenteric glands caseous.
		35	Intrav.	(4 cc.)	2,820	2,850	,,	62 ,,	Few tubercles in kidneys. A number of greyish translucent tubercles were scattered throughout the lungs. No tuberculosis elsewhere.

TISSUE EMULSION INJECTIONS INTO RABBITS—*continued.*

CLASS I.—Virulent Viruses.

Virus.	Source of tissue emulsion.	Number of Rabbit.	Mode of injection.	Estimated dose of tubercle bacilli and volume of emulsion.	Weight in grammes.		Killed or died.	Duration of life.	Result.
					Initial.	Final.			
H 19. "S.W."	Calf 159	7	Intrap.	—	2,870	2,200	Died	46 days	Peritoneum widely studded with tubercles. Omentum formed a large solid tumour. Spleen and liver contained numerous minute tubercles, the latter several larger ones also. Numerous tubercles in kidneys. Lungs extraordinarily full of small tubercles. Numerous tubercles in ovaries and on surface of uterus.
		8	Subcut.	—	2,300	2,620	Killed	59 „	Local ulcer. Nearest glands caseous. Tubercles in kidneys, spleen, and a few in liver. Lungs full of grey translucent tubercles with yellow centres. Bronchial, iliac, and sacral glands caseous. Mesenteric glands normal. One large tubercle on wall of heart. A thick Peyer's patch in the ileum was studded with opaque foci, apparently tubercles.
	Calf 179	13	Intrav.	—	2,500	2,150	„	40 „	Lungs closely packed with irregular tubercles with yellow centres. Liver and spleen similarly affected, but the tubercles were more regular and rounded. Kidneys showed similar tubercles, and also very numerous translucent foci. Many glands were full of small yellow foci. The intestine contained tubercles. Mesenteric glands normal.
		14	Intrap.	—	2,650	2,230	„	50 „	Numerous small tubercles in peritoneal tissues. Omentum formed the usual solid mass. Spleen thickly studded with yellowish tubercles. Liver thickly packed with grey inconspicuous tubercles. Kidneys studded with small tubercles. Lungs thickly packed with grey tubercles with yellow centres. Tubercle bacilli were found in the marrow of the femur.
H 20. "F.L."	Human mesenteric glands.	9	„	—	3,200	2,340	Died	88 „	Caseous lesion in abdominal wall. Nearest glands caseous. Innumerable small tubercles on omentum and diaphragm. Kidneys studded with white hobnail tubercles. Lungs almost entirely composed of tubercles, often confluent, caseating in the centres. Numerous tubercles on costal pleura. Liver appeared normal. Spleen very slightly affected. Tubercle bacilli fairly numerous in marrow from vertebral column.
		10	Subcut.	—	3,180	2,520	„	104 „	No local ulcer. Inguinal glands normal. Omentum, liver and spleen normal. Kidneys showed a very large number of small raised tubercles. Lungs showed innumerable tubercles, the majority of which were confluent.
	Calf 213	68	Intrav.	168,900 (0·5 cc.)	1,770	1,710	„	38 „	Lungs very heavy, composed of a network of translucent tissue with yellow points. Liver showed a number of pin-point tubercles. Spleen and kidneys contained rather larger whitish tubercles. The hepatic glands were partly caseating; other lymphatic glands appeared normal.

TISSUE EMULSION INJECTIONS INTO RABBITS—*continued.*

CLASS II.—Slightly Virulent Viruses.

Virus.	Source of tissue emulsion.	Number of Rabbit.	Mode of injection.	Estimated dose of tubercle bacilli and volume of emulsion.	Weight in grammes. Initial.	Weight in grammes. Final.	Killed or died.	Duration of life.	Result.
H 18. "T.T." *—continued.*	G.P. 1173	**78**	Intrap.	10,796,000 (1 cc.)	—	3,420	Killed	120 days	Some caseous tubercles in omentum. Peritoneum normal. Organs normal.
		79	Intrav.	10,796,000 (1 cc.)	1,920	3,040	,,	120 ,,	Few large translucent fibrous patches, with minute opaque foci, in lungs. Some caseous tubercles of the usual type in the kidneys.
H 30. "E.M."	Human mesenteric and bronchial glands through G.P. 1285	**114**	Intrap.	(5 cc.)	1,020	2,550	Killed	72 ,,	Behind the omentum was a little dirty-coloured cyst, with caseous contents, which seemed to be a dead cysticercus. This caseous material contained numerous tubercle bacilli. There were several normal cysticerci also. No sign of tuberculosis elsewhere.
	Human mesenteric and bronchial glands through G.P.'s 1336–1349	**121**	,,	158,560,000 (1 cc.)	1,430	3,200	,,	94 ,,	Slight tuberculous peritonitis. One tubercle in left kidney. Liver and spleen normal. A few translucent tubercles in lungs.
		122	,,	1,427,040,000 (9 cc.)	1,630	1,350	Died	28 ,,	The omentum was a large firm mass containing a number of caseous points. The peritoneum above the brim of the pelvis, that covering the intestines and that also forming the mesentery, was thickly studded with pin-point tubercles. The spleen contained a number of white points, which projected above the surface. Liver, kidneys, and lungs normal.
H 57. "B.J."	Human lung	**723**	,,	(5 cc.) Very rich in T.B.	1,380	910	,,	36 ,,	Slight tuberculous peritonitis. Kidneys showed numerous grey points on their surface, and a few white tubercles in their interior. The lungs showed a few whitish foci (? tubercles) on their dorsal surfaces. No tuberculosis elsewhere. Severe cysticercosis.
		724	,,	(1 cc.) Very rich in T.B.	1,330	3,050	Killed	177 ,,	Slight tuberculous peritonitis. There were one or two yellow streaks in the medulla of each kidney, and a small muco-purulent collection in the pelvis of the left. No tuberculosis elsewhere.
	Human mesenteric glands	**725**	,,	(5 cc.) Rich in T.B.	1,630	1,170	Died	172 ,,	Slight tuberculous peritonitis. Each kidney showed on section a number of tuberculous wedges penetrating cortex and medulla, and there were muco-purulent collections in the pelves, especially in that of the left. Five or six small tubercles, with caseating centres, were seen in lungs.
		726	,,	(1 cc.) Rich in T.B.	1,410	2,120	Killed	72 ,,	Very slight tuberculous peritonitis. Some yellow caseous streaks were seen in the medulla of each kidney. There were a few very insignificant grey tubercles in lungs.

TISSUE EMULSION INJECTIONS INTO RABBITS—*continued.*

CLASS I.—Virulent Viruses.

Virus.	Source of tissue emulsion.	Number of Rabbit.	Mode of injection.	Estimated dose of tubercle bacilli and volume of emulsion.	Weight in grammes.		Killed or died.	Duration of life.	Result.
					Initial.	Final.			
H 20. "F.L." —*continued.*	Calf 213	**69**	Intrap.	675,000 (2 cc.)	2,420	1,750	Died	45 days	Small caseous lesion in abdominal wall. Omentum formed the usual solid mass. Tuberculous peritonitis. Very numerous very small white tubercles in liver. There were a number of large tubercles in spleen and kidneys. Lungs almost solid with tubercles, translucent with yellow centres. Large tuberculous deposits in tunica vaginalis and testes. Bronchial and mesenteric glands caseous, the latter calcareous also in parts.
	Calf 223 through G.P.'s 1,153—1,154.	**87**	,,	143,625,000 (1·25 cc.)	2,850	1,700	,,	37 ,,	Caseous lesions in subcutaneous tissue and in nearest glands. Intense tuberculous peritonitis. Few grey tubercles in liver and spleen; a moderate number in kidneys. Lungs packed with small tubercles and solid in parts. Large tuberculous plaques on diaphragm.
		88	Intrav.	114,900,000 (1 cc.)	3,690	3,020	,,	12 ,,	Lungs thickly peppered with innumerable minute white tubercles. Abdominal organs appeared normal, but microscopic examination showed numerous tubercle bacilli in liver and spleen; also in rib marrow. Lymphatic glands apparently normal.
	Heifer 253	**110**	Intrap.	31,523,000 (0·5 cc.)	1,520	970	,,	74 ,,	Large caseous omentum. Tubercles on large intestine and meso-colon. Few tubercles in liver and spleen. Kidneys packed with large tubercles commencing to caseate. Lungs almost completely consolidated, with innumerable irregular caseating points.
		111	Intrav.	31,523,000 (0·5 cc.)	1,300	980	,,	22 ,,	Lungs thickly studded with small grey tubercles with white centres. Pericardium covering right ventricle similarly affected. Bronchial glands contained small caseous deposits. Spleen showed innumerable white specks. Liver apparently normal. A few small white tubercles seen in kidneys. Numerous tubercle bacilli in liver and spleen.
		112	Intrap.	1,261,000	1,300	1,870	Killed	73 ,,	Enormous caseous omentum. Many tubercles on cæcum. Few tubercles in liver and spleen. Moderate number in kidneys, large and prominent. Lungs packed with large tubercles with caseating centres.
		113	Intrav.	1,261,000	1,270	560	Died	40 ,,	Lungs congested, œdematous, packed with tubercles in clusters. Innumerable tubercles seen in the marrow of the translucent ribs. Numerous tubercles in heart. Innumerable small tubercles seen in intestines. Liver and spleen full of small tubercles; the latter also contained necrotic areas. Few tubercles in kidneys.
H 32. "Y.W."	Human lung.	**163**	Intrap.	251,600,000 (5 cc.)	2,220	1,800	,,	13 ,,	Death due to an acute infection.
		164	,,	352,240,000 (7 cc.)	1,900	1,530	,,	5 ,,	Cause of death not determined.

TISSUE EMULSION INJECTIONS INTO RABBITS—*continued.*

CLASS II.—Slightly Virulent Viruses.

Virus.	Source of tissue emulsion.	Number of Rabbit.	Mode of injection.	Estimated dose of tubercle bacilli and volume of emulsion.	Weight in grammes.		Killed or died.	Duration of life.	Result.
					Initial.	Final.			

TISSUE EMULSION INJECTIONS INTO RABBITS—*continued.*

CLASS I.—Virulent Viruses.

Virus.	Source of tissue emulsion.	Number of Rabbit.	Mode of injection.	Estimated dose of tubercle bacilli and volume of emulsion.	Weight in grammes.		Killed or died.	Duration of life.	Result.
					Initial.	Final.			
H 32. "Y.W." —*continued.*	Human bronchial glands.	**165**	Intrap.	(5 cc.)	1,270	1,040	Died	18 days	Intense tuberculous peritonitis. No definite tubercles seen in liver or spleen. Kidneys and lungs normal. Tubercle bacilli in liver and spleen; numerous in rib marrow.
		166	,,	(5 cc.)	1,520	1,170	Killed (dying)	97 ,,	Tuberculous peritonitis; omentum formed the usual solid mass. Many tubercles on surface of liver and spleen; none on section. Few tubercles in kidneys. Lungs large and solid, composed of irregular confluent caseating nodules, with very little air-containing tissue between.
	Human mesenteric glands.	**167**	,,	587,100,000 (10 cc.)	1,890	1,740	Died	3 ,,	Death from pericarditis.
		168	,,	587,100,000 (10 cc.)	2,050	1,600	,,	12 ,,	Tuberculous septicæmia; acute peritonitis.
	Calf 487.	**182**	Intra-muscular	31,030,000 (1 cc.)	1,810	1,750	,,	71 ,,	Large caseating tumour in abdominal wall. Peritoneum normal. Lungs filled with large caseating nodules embedded in translucent tissue. Few small tubercles in spleen; liver normal; several large tubercles in each kidney.
		183	Intra-muscular	31,030,000 (1 cc.)	2,560	2,250	,,	57 ,,	Large caseo-necrotic tumour in abdominal wall. Peritoneum normal. Lungs almost entirely airless, composed of fibro-tuberculous deposit, with little islands of dark red lung tissue between. The irregular centres of the tubercles were bright whitish-yellow. Liver and spleen normal; kidneys contained a few tubercles.
H 49. "T.C."	Human lung.	**340**	Intrap.	(10 cc.)	1,350	1,340	,,	1 ,,	Acute peritonitis.
	Human mesenteric gland.	**341**	,,	(5 cc.)	1,230	920	,,	6 ,,	,, ,,
	Human mesenteric gland, through G.P. 1503.	**371**	,,	Small dose	870	860	,,	90 ,,	Tuberculous peritonitis; omentum thickened and caseous. Liver and spleen peppered throughout with small tubercles. Kidneys full of large wedge-shaped tubercles. Lungs almost solid with tubercles commencing to caseate. Poststernal glands caseous.
H 59. "L.B."	Human lung.	**768**	,,	(8 cc.)	1,830	1,290	,,	23 ,,	Severe tuberculous peritonitis. Liver extremely thickly packed with very minute tubercles. Spleen much enlarged and contained similar tubercles. Numerous small grey tubercles seen on the surface of each kidney; the substance is faintly mottled. Lungs full of minute tubercles with red margins, more or less confluent in the left. Thoracic glands caseous. Numerous tubercles on visceral pericardium.

TISSUE EMULSION INJECTIONS INTO RABBITS—*continued.*

CLASS II.—Slightly Virulent Viruses.

Virus.	Source of tissue emulsion.	Number of Rabbit.	Mode of injection.	Estimated dose of tubercle bacilli and volume of emulsion.	Weight in grammes.		Killed or died.	Duration of life.	Result.
					Initial.	Final.			

TISSUE EMULSION INJECTIONS INTO RABBITS—*continued.*

CLASS I.—Virulent Viruses.

Virus.	Source of tissue emulsion.	Number of Rabbit.	Mode of injection.	Estimated dose of tubercle bacilli and volume of emulsion.	Weight in grammes.		Killed or died.	Duration of life.	Result.
					Initial.	Final.			
H 59. "L.B." —*continued.*	Human mesenteric glands.	**769**	Intrap., and largely intra-cœcal.	(7 cc.)	1,740	1,330	Died	128 days	Very slight tuberculous peritonitis. Large tuberculous ulcer in cæcum, and numerous tubercles in terminal portion of ileum and in vermiform appendix. Mesenteric glands contained caseous foci. Liver and spleen normal. Kidneys contained rather large tubercles just under the capsule. Lungs very large, chiefly composed of confluent caseous tubercles. Very large thick caseous plaques on the diaphragm. Thoracic glands large and caseous.
H 64. "M.G."	Human mesenteric glands.	**806**	Intrap.	—	1,500	2,200	Killed	29 „	The material injected was found either lying loose in one or two large prismatic masses between the coils of the intestines, or lightly encysted in the folds of the omentum. This material was dry and seemed to have undergone no change since injection. There was no appreciable reaction around it. There was no sign of tubercle anywhere, except in some yellow foci in the posterior layer of the omentum; these contained tubercle bacilli.

Human Tuberculosis, believed to be Primary in Joints.

TISSUE EMULSION INJECTIONS INTO RABBITS—*continued.*

Class II.—Slightly Virulent Viruses.

Virus.	Source of tissue emulsion.	Number of Rabbit.	Mode of injection.	Estimated dose of tubercle bacilli and volume of emulsion.	Weight in grammes.		Killed or died.	Duration of life.	Result.
					Initial.	Final.			
				Human Tuberculosis, believed to be Primary in Joints.					
H 9. "C.T." [Wrist joint.]	Calf 185	3	Intrap.	—	2,660	2,370	Died	13 days	Death from an acute infection.
		4	Subcut.	—	2,750	2,390	,,	13 ,,	Caseous mass at seat of inoculation in abdominal wall. No tuberculosis elsewhere. Cause of death not determined.
	Calf 331	83	Intrap.	456,000 (1 cc.)	920	2,970	Killed	109 ,,	Very slight tuberculous peritonitis. One tubercle with softened centre was found in the lung.
		84	Intrav.	456,000 (1 cc.)	1,770	3,130	,,	109 ,,	One pin-head grey tubercle in lung. One kidney contained a tubercle, and the pelvis was full of curdy mucoid matter, which was swarming with tubercle bacilli.
H 11. "E.D." [Elbow joint.]	Calf 309	93	Intrap.	1,098,666 (1 cc.)	1,790	2,690	,,	87 ,,	A large smooth tumour the size of a pigeon's egg, containing thick creamy pus in a fibrous capsule, was attached to the omentum. Close by was another, the size of a pea. There was no peritonitis. A few translucent tubercles, some with yellow central opacity, were seen in the lungs.
	Calf 307, through G.P. 1,156.	96	Intrap.	(8 cc.)	1,400	930	Died.	35 ,,	Death due to an infection other than tuberculosis. There was a slight amount of tuberculous disease on the peritoneum and omentum, and the mesenteric glands were caseous.
		97	Intrav.	(1 cc.)	1,320	1,020	,,	5 ,,	Death due to cysticercosis. Lungs appeared normal.

TISSUE EMULSION INJECTIONS INTO RABBITS—*continued.*

CLASS I.—Virulent Viruses.

Virus.	Source of tissue emulsion.	Number of Rabbit.	Mode of injection.	Estimated dose of tubercle bacilli and volume of emulsion.	Weight in grammes.		Killed or died.	Duration of life.	Result.
					Initial.	Final.			
Human Tuberculosis, believed to be Primary in Kidney.									

TISSUE EMULSION INJECTIONS INTO RABBITS—*continued.*

CLASS II.—Slightly Virulent Viruses.

Virus.	Source of tissue emulsion.	Number of Rabbit.	Mode of injection.	Estimated dose of tubercle bacilli and volume of emulsion.	Weight in grammes.		Killed or died.	Duration of life.	Result.
					Initial.	Final.			
H 15. "I.W." [Ankle joint.]	Calf 193, through G.P. 1153	**58**	Intrap.	8,178,000 (3 cc.)	2,660	2,840	Killed	114 days	Slight tuberculous peritonitis. One or two grey tubercles in each kidney. Liver and spleen normal. Lungs contained a good many minute translucent tubercles.
		59	Intrav.	4,089,000 (1·5 cc.)	3,080	2,510	Died	99 ,,	Lungs were somewhat thickly studded with yellowish-white raised tubercles. Very small tubercles seen in each kidney. No tuberculosis elsewhere.
	Calf 409	**91**	Intrap.	22,805,000 (5 cc.)	980	910	,,	19 ,,	Death from some acute infection.
		92	Intrav.	4,563,000 (1 cc.)	1,080	2,350	Killed	92 ,,	Lungs contained rather numerous minute tubercles, consisting of a minute central opacity with a grey margin. Each kidney showed two or three prominent pearly tubercles, extending like a wedge into the cortex; the pelvis of the right contained a quantity of muco-purulent material in which T.B. were numerous.
	Calf 195	**19**	Intrap. and partly subcut.	—	700	1,400	,,	38 ,,	Large flat caseous tumour in subcutaneous tissue at seat of inoculation. Inguinal glands normal. Very slight tuberculous peritonitis. All organs normal.
	Calf 195, through G.P.'s 967-970	**30**	Intrap. and partly subcut.	29,124,000 (4 cc.)	1,780	1,220	Died	49 ,,	The whole of the ventral surface of the body was occupied by a huge sloughing ulcer. The inguinal glands formed a large mass which on section discharged thin yellow pus. There was slight tuberculous peritonitis. Death due to pyæmia.
		31	Intrav.	29,124,000 (4 cc.)	2,620	2,020	,,	128 ,,	The lungs, especially in their thinner parts, were largely occupied by nodular grey translucent masses. The right kidney showed a moderate number of tubercles on the surface, and numerous smaller ones on section; the left was similar, but less severely affected. Three small (?) tubercles seen in liver. Spleen normal.
H 16. "J.H." [Knee joint.]	Calf 527	**237**	Intrap.	—	2,110	3,130	Killed	116 ,,	A few little yellow foci were scattered here and there in the peritoneal tissues. No tuberculosis elsewhere.
	Calf 631	**389**	,,	2,415,000 (5 cc.)	1,000	3,310	,,	192 ,,	A few little yellow softened nodules in omentum. No tuberculosis elsewhere.
				Human Tuberculosis, believed to be Primary in Kidney.					
H 26. "K.M."	Human kidney through G.P. 1326	**142**	Intrap.	1,767,966,000 (3·5 cc.)	2,520	3,570	Killed	136 days	Small yellow caseous grains, and a small encysted mass of softened caseous material, in omentum. Peritoneum normal. Four large grey nodules, containing yellow caseous points, projected from the surface of each kidney. One or two small grey tubercles in lungs and spleen. Liver normal.
		143	Intrav.	505,133,000 (1 cc.)	2,400	1,590	Died	23 ,,	Lungs heavy, œdematous, and dark pink in colour; innumerable minute tubercles could be seen in them with a hand lens. Spleen, liver and kidneys did not appear normal, but no tubercles could be distinguished with certainty in them. A few tubercle bacilli were found in scrapings from all three organs.

CULTURE INJECTIONS INTO RABBITS.

CULTURE INJECTIONS INTO RABBITS. (*All Intraperitoneal.*)

CLASS I.—Virulent Viruses.

Virus, and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.
Origin of Virus: Human Tuberculosis, believed to be Primary in Lung.								
H 2. Sp. A. - [Virulent Strain.] [Lung.]	Heifer 11, through G.P. 340.	18 months	10· mg.	**159**	1,850	Died	17 days	Omentum formed a solid yellowish mass. Severe tuberculous peritonitis. Liver showed a few pinpoint tubercles. Lungs were heavy, and contained a very large number of colourless almost invisible tubercles. The marginal areas of the lung were solid. The bronchial glands were caseous. The spleen and kidneys seemed to be normal on section.
	,, ,,	,,	1· ,,	**157**	1,720	,,	35 ,,	Severe tuberculous peritonitis. Omentum a mass of tubercles. Liver and spleen were studded as thickly as possible with minute grey tubercles. Lungs contained very little air, being largely composed of translucent grey tubercles with minute yellow centres.
	,, ,,	,,	0·1 ,,	**158**	1,750	,,	24 ,,	Severe tuberculous peritonitis. Omentum formed the usual solid caseous mass. Spleen swollen without visible tubercles. Liver and kidneys appeared normal. Lungs contained numerous minute tubercles and consolidated areas.
	,, ,,	20 months	10· mg.	**207**	1,910	,,	17 ,,	Severe tuberculous peritonitis. Omentum rolled up into a solid mass, containing caseous foci. Spleen and liver normal on section. Kidneys and lungs normal. Thoracic glands enlarged and caseous.
	,, ,,	,,	1· ,,	**208**	1,900	,,	23 ,,	Severe tuberculosis peritonitis. Omentum of usual type. Liver and kidneys full of scarcely visible tubercles. Lungs largely consolidated, packed with small confluent tubercles with minute opaque centres. Numerous tubercles on surface of heart.
	,, ,,	,,	0·1 ,,	**209**	2,550	,,	35 ,,	Severe tuberculous peritonitis. Omentum of usual type. Spleen and liver normal on section. Moderate number of tubercles in each kidney. Lungs packed with tubercles and largely consolidated.
	Calf 91, through G.P. 651.	13 months	10· mg.	**162**	2,160	,,	25 ,,	Lesions similar to those in 158; in addition a few tubercles were seen in the right kidney.
	,, ,,	,,	1· ,,	**161**	2,090	,,	39 ,,	Severe tuberculous peritonitis. Omentum of usual type. Liver and spleen full of small tubercles. Kidneys showed fairly numerous larger tubercles. Lungs full of tubercles with little caseous centres and spreading translucent margins which tended to coalesce.

CULTURE INJECTIONS INTO RABBITS. (*All Intraperitoneal.*)

CLASS II.—Slightly Virulent Viruses.

Virus, and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.
Origin of Virus: Human Tuberculosis, believed to be Primary in Lung.								
H 2. Sp. A. [Non-virulent Strain.] [Lung.]	Calf 111, through G.P. 640.	20 months	10 mg.	**435**	800	Died	10 days	Death from causes other than tubercle.
	" "	"	1· "	**436**	1,000	Killed	90 "	Few yellow specks in omentum. Peritoneum normal. One small tubercle in lung.
	" "	"	0·1 "	**437**	1,150	"	90 "	Ditto; but three tubercles in lung.
H 17. Sp. B.* [Lung.]	Calf 265, direct	10 months	10 mg.	**232**	2,260	"	90 "	Large caseous abscess in left iliac fossa. Numerous pea-sized caseous masses enclosed in thin membranes scattered about the peritoneum. Few small yellow patches on mesentery and omentum. Few prominent translucent tubercles in kidneys, and some caseous matter in pelvis of right. One or two minute tubercles in lungs.
	" "	"	1· "	**231**	2,130	"	90 "	Some delicate yellow patches on omentum and various peritoneal tissues. Four minute tubercles in left kidney. Some translucent nodules with yellow centres, and numerous small grey tubercles, in lungs.
	" "	"	0·1 "	**230**	1,930	"	90 "	An occasional minute focus seen on mesentery. No tubercles on omentum. Few minute translucent tubercles in lungs.
	Calf 339, through G.P. 1235.	8 months	50 mg.	**265**	1,230	Died	73 "	Several thin-walled caseous masses in peritoneal cavity. Few little tubercles in left kidney. Death from pneumonia.
	" "	"	10· "	**266**	1 190	Killed	91 "	Some encysted caseous masses in peritoneal cavity. Many yellow-centred tubercles in omentum. One tubercle in left kidney, two in lungs.
	" "	"	1· "	**267**	1,230	"	91 "	Few translucent tubercles on peritoneal tissues; caseous tubercles in omentum. Rather numerous small grey tubercles in lungs.
H 22. "F.W." [Lung.]	Calf 293, direct	14 months	50· mg.	**381**	1,150	"	68 "	Slight tuberculous peritonitis. Right kidney and lungs contained a number of small grey tubercles.
	" "	"	10· "	**382**	900	"	90 "	Very slight tuberculous peritonitis. Each kidney contained a good many tubercles. Few minute foci in lungs. Uterus distended with tuberculous pus.
	" "	"	1· "	**383**	900	"	90 "	Slight tuberculous peritonitis (as in 267). One wedge-shaped tubercle in the cortex of each kidney.
	" "	"	0·1 "	**384**	960	"	90 "	Few translucent tubercles in omentum. One in each kidney; one or two in lungs.
H 23. "J P." [Lung.]	Calf 365, direct	8 months	50· mg.	**243**	1,140	"	90 "	Numerous encysted caseous masses in peritoneal cavity. Small inconspicuous tubercles in lungs. Numerous small tubercles in cortex of each kidney, caseous striæ in the medulla, and purulent matter in each pelvis.

* This virus increased in virulence after passage through Calves.

CULTURE INJECTIONS INTO RABBTIS—*continued.* (*All Intraperitoneal.*)

CLASS I.—Virulent Viruses.

Virus, and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.
H 2. Sp. A.—*continued.* [Virulent Strain.] [Lung.]	Calf 91, through G.P. 651.	13 months	0·1 mg.	**160**	1,650	Died	35 days	Lesions similar to those in 157; in addition a few tubercles were seen in each kidney.
	Calf 93, through G.P. 534.	2 years, 3 months.	10· mg.	**567**	1,370	,,	17 ,,	Severe tuberculous peritonitis. Omentum of usual type. Lungs large, partly consolidated, and packed with tubercles. None seen in abdominal organs.
	,, ,,	,,	1· ,,	**568**	1,370	,,	31 ,,	Acute tuberculous peritonitis. Omentum formed only a small tumour. Kidneys contained numerous small tubercles. The lungs were packed with them. Spleen much enlarged; no tubercles visible in it or the liver.
	,, ,,	,,	1· ,,	**569**	1,320	,,	42 ,,	Moderate amount of tubercle in peritoneal cavity. Numerous small dark grey tubercles on surface of kidneys, and a few paler ones on section. Spleen and liver normal on section. Numerous small tubercles in partly consolidated lungs.
	,, ,,	,,	0·1 ,,	**570**	950	,,	34 ,,	Lesions similar to those in 157; in addition the kidneys were packed with minute tubercles.

CULTURE INJECTIONS INTO RABBITS—*continued.* (*All Intraperitoneal.*)

CLASS II.—Slightly Virulent Viruses.

Virus, and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Rabbit.	Weight in grammes.	Killed or died	Duration of life after inoculation.	Result.
H 23. "J.P." [Lung.] *continued.*	Calf 365, direct.	8 months.	10· mg.	**242**	1,390	Killed.	90 days.	Encysted caseous masses in peritoneal cavity. Numerous tubercles in cortex, and pus in the pelvis, of each kidney. Translucent tubercles and caseous foci seen here and there in pink outgrowths along the margins of the lungs.
	,, ,,	,,	1· ,,	**241**	1,200	,,	90 ,,	Very slight tuberculous peritonitis. One or two small fibrous tubercles in lungs.
H 25. "A.T." [Lung.]	Calf 417, direct	10½ months	50· mg.	**479**	1,010	,,	116 ,,	Slight tuberculous peritonitis. One minute tubercle in left kidney and lung.
	,, ,,	,,	10· ,,	**476**	1,240	,,	116 ,,	Few fibrous tubercles in omentum, and one in left kidney.
	,, ,,	,,	1· ,,	**477**	1,100	,,	116 ,,	No sign of tubercle in peritoneal cavity. Few small fibrous tubercles in lungs.
	,, ,,	,,	0·1 ,,	**478**	1,150	,,	116 ,,	Very slight tuberculous peritonitis. One minute tubercle in left kidney.
	,, ,,	15 months	10· mg.	**642**	1,850	,,	108 ,,	In omentum were several soft caseous masses covered with a thin layer of peritoneum. In the pelvis of each kidney was some soft caseous matter. In the lungs were some minute tubercles.
	,, ,,	,,	10· ,,	**643**	1,920	,,	108 ,,	Encysted caseous masses in peritoneal cavity. Some caseous matter in pelvis of right kidney.
	Dog 1, through G.P. 1,833.	12 weeks	10· mg.	**912**	1,600	,,	124 ,,	Slight tuberculous peritonitis. In the omentum were thin-walled nodules filled with caseo-pus. The spermatic cords were thickened and caseating. In the testicles were large caseous nodules (tubercle bacilli numerous). Each kidney showed grey tubercles in the cortex, and caseous streaks and foci in the medulla; the pelvis of the right was filled with caseo-pus. In the lungs were some irregular grey translucent tubercles.
	,, ,,	,,	10· ,,	**913**	1,590	,,	124 ,,	Peritoneum normal. Liver contained three or four grey tubercles with yellowish-white centres.
	,, ,,	,,	1· ,,	**914**	1,710	Died	50 ,,	Trace of tuberculosis in peritoneum. Death due to hæmorrhage
H 45. "F.M." [Lung]	Human bronchial glands, through G.P. 1137.	11 months	50· mg.	**368**	600	Killed	90 ,,	Very slight tuberculosis of peritoneum. One calcareous tubercle in lung.
	,, ,,	,,	10· ,,	**369**	870	,,	90 ,,	Slight tuberculosis of peritoneum. One small grey tubercle in each kidney, and a few with yellow centres in lungs.
	,, ,,	,,	1· ,,	**370**	940	,,	90 ,,	Some small fibro-caseous tubercles in omentum; a few fibrous tubercles in kidneys.
H 48. "W.P." [Lung]	Human lung, through G.P. 1494	1½ months	50· mg.	**418**	1,100	,,	90 ,,	Encysted caseous masses in peritoneal cavity only.
	,, ,,	,,	10· ,,	**419**	1,350	,,	90 ,,	Few yellow-centred translucent tubercles in omentum. A few in lungs; one or two in right kidney
	,, ,,	,,	1· ,,	**420**	1,400	,,	90 ,,	Few yellow foci in omentum, and irregular grey patches, with caseous foci in lungs.
	,, ,,	,,	0·1 ,,	**421**	1,120	,,	90 ,,	do. do.

CULTURE INJECTIONS INTO RABBITS—*continued.* (*All Intraperitoneal.*)

CLASS I.—Virulent Viruses.

Virus, and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milli-grammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.

CULTURE INJECTIONS INTO RABBITS—*continued.* (*All Intraperitoneal.*)

CLASS II.—Slightly Virulent Viruses.

Virus, and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.
H 50. "P.H." [Lung]	Human lung, through G.P. 1490	3 months	50· mg.	**480**	1,470	Killed	112 days	Few small soft caseous masses in omentum only.
	,, ,,	,,	10· ,,	**481**	1,140	Died	25 ,,	Numerous minute milky tubercles on pink and œdematous omentum and on peritoneal tissues. All organs normal.
	,, ,,	,,	1· ,,	**482**	1,170	Killed	112 ,,	Very slight tuberculosis of omentum; few small tubercles in left kidney.
	,, ,,	,,	0·1 ,,	**48**	810	Died	4 ,,	No tuberculosis.
	,, ,,	15 months	10. mg.	**918**	1,520	Killed	93 ,,	Slight tuberculous peritonitis. Twelve prominent grey nodules in cortex of left kidney; many yellow tubercles in medulla, and caseo-pus in pelvis. Right kidney similar. A few tubercles in lungs.
H 51. "H.M." [Lung]	Human lung, direct	3 months	1· mg.	**554**	1,120	,,	77 ,,	Few translucent tubercles on peritoneal surface of rectum and on omentum, and some caseous lymphatics in the latter. Few grey tubercles in kidneys and lungs.
	,, ,,	4 months	10· mg.	**631**	1,890	,,	136 ,,	Slight tuberculosis of peritoneum, tunica vaginalis, lungs and kidneys. Tuberculosis of the vasa deferentia and the vesiculæ seminales. Caseation of the lymphatics and lymphatic glands on the pleural surface of sternum.
	,, ,,	,,	1· ,,	**632**	1,810	,,	136 ,,	Few minute translucent tubercles in omentum. One or two in each kidney. Several in lungs.
	,, ,,	,,	1· ,,	**633**	1,770	,,	136 ,,	Few minute tubercles in omentum. Small number of grey patches, with an occasional opaque focus, in lungs.
	,, ,,	,,	0·1 ,,	**634**	1,720	,,	136 ,,	do. do.
H 52. "T.F." [Lung]	Human lung, through G.P. 1565.	2 months	10· mg.	**615**	920	Died	18 ,,	Very early acute tuberculous peritonitis. Omentum a solid mass, with caseating foci. Lungs pink, and showed many small ill-defined tubercles. Tubercle bacilli found in spleen, kidneys, liver, and rib marrow.
	,, ,,	,,	1· ,,	**616**	1,090	,,	2 ,,	Death from psorospermosis.
	,, ,,	,,	1· ,,	**617**	800	,,	33 ,,	Slight tuberculous peritonitis. One tubercle in left kidney. Cause of death not determined.
	,, ,,	,,	0·1 ,,	**618**	960	Killed	91 ,,	Some small caseo-fibrous tubercles in omentum. Some small fibrous tubercles in right kidney and a wedge-shaped tuberculous infarct in left.
H 56. "F.T." [Lung]	Human lung through G.P. 1682.	3 months	10· mg.	**707**	1,260	,,	104 ,,	Irregular caseous patches in omentum. Slight chronic tuberculosis of peritoneum. Kidneys contained caseo-pus in the pelves. Some small caseo-fibrous tubercles in lungs. Few yellow foci in liver.
	,, ,,	,,	1· ,,	**708**	1,310	,,	104 ,,	Omentum and peritoneum as in 707. One small tubercle in each kidney.
	,, ,,	,,	1· ,,	**70**	1,360	,,	104 ,,	Omentum and peritoneum as in 707. Few translucent tubercles in kidneys and lungs, and some yellow foci in liver.
	,, ,,	,,	0·1 ,,	**710**	1,230	,,	104 ,,	Omentum and peritoneum as in 707. Few insignificant grey tubercles in lungs.

CULTURE INJECTIONS INTO RABBITS—*continued.* (*All Intraperitoneal.*)

CLASS I.—Virulent Viruses.

Virus, and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milli-grammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.
Human Tuberculosis of uncertain Origin, possibly Primary in Bronchial Glands.								

CULTURE INJECTIONS INTO RABBITS—*continued.* (*All Intraperitoneal.*)

CLASS II.—Slightly Virulent Viruses.

Virus, and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.
62. "W.M." [Lung.]	Human sputum, through G.P 1786.	3½ months	1· mg.	850	790	Killed	91 days	Few tuberculous nodules in the posterior layer of omentum only.
	„ „	„	1· „	851	850	„	91 „	Ditto.
	Human Tuberculosis of uncertain Origin, possibly Primary in Bronchial Glands.							
35. "C.B." [Bronchial gland (?).]	Human bronchial gland, through G.P. 571.	18 months	50· mg.	228	2,220	Killed	89 days	Numerous pea-sized encysted caseous masses in peritoneum. There were collections of caseo-purulent material in the tunica vaginalis and in the epididymus. There were few tubercles in kidneys and lungs, and caseo-purulent collections in the pelves of the former.
	„ „	„	10· „	227	2,010	„	89 „	Ditto.
	„ „	„	1· „	226	2,000	„	89 „	Injection partly intramuscular. Caseous abscess in abdominal wall. Very slight tuberculosis of peritoneum. Fibrous tubercles in lungs. Numerous tubercles in left meso-testis.
54. "C.W." [Bronchial gland (?).]	Human spleen, through G.P. 1609.	2 months	10· mg.	635	1,800	„	129 „	Slight tuberculous peritonitis. There were some caseous tubercles in the medulla of each kidney, and caseous deposit in the pelves. Few fibro-caseous tubercles in lungs.
	„ „	„	1· „	636	1,500	„	129 „	Slight tuberculous peritonitis. Moderate number of minute translucent tubercles in lungs.
	„ „	„	1· „	637	1,170	„	129 „	Slight tuberculous peritonitis. There were one or two tubercles in each kidney, and caseous deposits in the pelves. Few minute translucent tubercles in lungs.
	„ „	„	0·1 „	638	1,400	Died	100 „	Chronic tuberculous peritonitis. Numerous grey yellow-centred tubercles in kidneys and lungs: in the latter they were often confluent. Rather severe for a virus of Group II.
61. "E.C." [Bronchial gland (?).]	Human mesenteric glands, direct.	2 months	10· mg.	833	1,000	Killed	90 „	Slight tuberculous peritonitis. Some little fibrous tubercles in each kidney, and a few in lungs.
	„ „	„	1· „	834	840	„	90 „	Very slight tuberculous peritonitis. Few yellow streaks in medulla of each kidney. One or two fibrous tubercles in lung.
	„ „	„	1· „	835	750	„	90 „	Ditto; in addition there was some muco-purulent matter in the pelvis of the right kidney.
	Human brain, through G.P. 1837.	1 month	10· mg.	848	900	„	92 „	Peritoneum normal, except for one small tubercle on cæcum. One fibrous tubercle in left kidney.
	„ „	„	1· „	849	810	„	92 „	Few yellow streaks and foci on omentum. One tubercle in each kidney.

CULTURE INJECTIONS INTO RABBITS—*continued.* (*All Intraperitoneal.*)

CLASS I.—Virulent Viruses.

Virus, and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.
	Origin of Virus: Human Tuberculosis, believed to be Primary in Cervical Glands.							
H 28. "C.L." [Cervical glands.]	Human cervical glands, direct.	13 months	10· mg.	**456**	1,110	Died	36 days	Tuberculous peritonitis. Omentum solid and caseous. Kidneys contained a good many small tubercles. Spleen small and pale, no tubercles in it or in liver. Lungs voluminous, heavy, and packed with small tubercles, confluent, with caseous centres.
	„ „	„	1· „	**457**	1,100	„	40 „	Tuberculous peritonitis. Omentum of usual type. Numerous minute tubercles on surface of liver; spleen packed with tubercles; many also seen in each kidney. Lungs packed with confluent tubercles with rather large caseous centres.
	„ „	„	0·1 „	**458**	1,230	„	40 „	Severe tuberculous peritonitis. Omentum of usual type. Numerous minute tubercles in substance of liver, and a few in spleen and kidneys. Lungs as in 457.
	„ „	„	0·01 „	**459**	750	„	5 „	No tuberculosis. Death apparently from diarrhœa.
	Human cervical glands, through Rabbit 102.	14½ months	10· mg.	**559**	1,220	„	16 „	Innumerable minute tubercles on peritoneum. Omentum already thickened and caseating. No tubercles visible in an enlarged spleen, in liver or in kidneys. Many seen in lungs which did not collapse well.
	„ „	„	1· „	**560**	1,370	„	23 „	Lesions similar to 559; disease more advanced in lungs.
	„ „	„	1· „	**561**	1,250	„	23 „	Ditto.
	„ „	„	0·1 „	**562**	1,100	„	31 „	Tuberculous peritonitis. Omentum of usual type. Few tubercles in kidneys; none in liver or spleen. Lungs almost entirely consolidated by innumerable caseating tubercles.
H 29. "M.F." [Cervical glands.]	Human cervical glands, through G.P. 1329.	7 months	10· mg.	**273**	1,280	„	16 „	Lesions similar to 559; disease more advanced in lungs.
	„ „	„	1· „	**274**	1,210	„	18 „	Very severe tuberculous peritonitis; omentum of usual type. Liver, spleen, and kidneys peppered with innumerable scarcely visible tubercles. Lungs voluminous and heavy, similar on section.
	„ „	„	0·1 „	**275**	1,280	„	22 „	Very severe tuberculous peritonitis; omentum of usual type. Spleen enlarged, no visible tubercles. Few doubtful foci in kidneys. Liver peppered with innumerable minute foci. Lungs solid and pink, innumerable minute tubercles were barely visible.
	„ „	„	0·01 „	**276**	1,150	„	29 „	Severe tuberculous peritonitis. Omentum of usual type. Innumerable small tubercles in spleen and liver; very numerous in kidneys. Lungs solid with grey coalescing tubercles with yellow centres.
	„ „	8 months	1· mg.	**315**	1,020	„	22 „	Lesions as in 275; disease rather more advanced in lungs.

CULTURE INJECTIONS INTO RABBITS—*continued.* (*All Intraperitoneal.*)

CLASS II.—Slightly Virulent Viruses.

Virus, and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.
Origin of Virus: Human Tuberculosis, believed to be Primary in Cervical Glands.								
H 27. "B.D." [Cervical glands.]	Human cervical glands, through G.P. 1216.	8½ months	50·0 mg.	**302**	1,300	Killed	89 days	Soft caseous masses encysted in peritoneal cavity. Few tubercles in each kidney.
	,, ,,	,,	10·0 ,,	**303**	1,410	,,	89 ,,	Very slight tuberculous peritonitis. One or two minute tubercles in lungs.
	,, ,,	,,	1·0 ,,	**304**	1,250	,,	89 ,,	Slight tuberculous peritonitis. Few tubercles of chronic type in each kidney; the pelvis of the right had muco-purulent contents. Moderate number of translucent tubercles in lungs.
	,, ,,	,,	0·1 ,,	**305**	1,170	,,	89 ,,	Ditto; in this animal the left kidney also contained tuberculous deposit in the pelvis.
H 33. "R.T." [Cervical glands.]	Human axillary glands, direct.	4 months	50·0 mg.	**219**	2,530	Died	69 ,,	There had been some peritonitis; various peritoneal tissues were adherent, and the peritoneum had a sticky appearance. There was a good deal of caseous deposit in the omentum. Numerous small tubercles were seen in the kidneys. Lungs extensively consolidated with irregular grey patches, largely confluent. Poststernal glands large and caseous. General tuberculosis, not quite typical.
	,, ,,	,,	10·0 ,,	**218**	1,720	Killed	90 ,,	Slight tuberculous peritonitis. Tuberculous striæ in both kidneys, and pus in the pelvis of the left. Many grey translucent tubercles in lungs, some with yellow centres.
	,, ,,	,,	1·0 ,,	**217**	1,800	,,	90 ,,	Subcutaneous abscess in abdominal wall. Injection partly subcutaneous. Slight tuberculosis of omentum. A few small tubercles in lungs.
H 34. "C.U." [Cervical glands.]	Human cervical glands, through G.P. 236.	24 months	10·0 mg.	**225**	1,780	,,	88 ,,	Very slight tuberculous peritonitis. Some minute grey tubercles in lungs and kidneys; the pelvis of the right kidney was full of caseo-pus.
	,, ,,	,,	1·0 ,,	**224**	1,460	,,	88 ,,	Very slight tuberculous peritonitis. Several wedge-shaped tubercles in each kidney. Numerous irregular fibrous patches in lungs, containing an occasional caseous focus.
H 37. "O.J." [Cervical glands.]	Human cervical glands, through G.P. 1427.	2½ months	50·0 mg.	**240**	2,550	,,	90 ,,	Many soft caseous masses encysted in peritoneal cavity. Both kidneys showed small tubercles on the surface, caseating striæ in the medulla and muco-pus in the pelvis. Lungs largely consolidated by translucent patches, infiltrated by a moss-like caseous network.
	,, ,,	,,	10·0 ,,	**239**	2,120	,,	90 ,,	Very slight tuberculous peritonitis. Few small foci in kidneys. Some translucent tubercles in lungs, one with a caseous centre.
	,, ,,	,,	1·0 ,,	**238**	1,490	,,	90 ,,	Very slight tuberculous peritonitis. A few fibrous tubercles and nodules in lungs.

CULTURE INJECTIONS INTO RABBITS—*continued.* (*All Intraperitoneal.*)

CLASS I.—Virulent Viruses.

Virus, and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.
H 29. "M.F." —*continued.* [Cervical glands]	Human cervical glands, through G.P. 1329.	8 months	0·1 mg.	**316**	1,000	Died	30 days	Tuberculous peritonitis. Omentum of usual type. Liver and spleen peppered with minute tubercles; few only in kidneys. Lungs solid, peppered with little yellow points.
	,, ,,	,,	0·01 ,,	**317**	840	,,	91 ,,	Large caseous irregular prominent nodules scattered moderately thickly over the peritoneal tissues. Omentum not greatly thickened, but closely beset with small caseous tubercles. Spleen closely packed with small caseous tubercles. Moderate number of small grey tubercles in liver and a few in kidneys. Lungs contained a good many large nodules, caseous and softened, with translucent margins.
	,, ,,	11 months	10· mg.	**513**	1,110	,,	11 ,,	Very early tuberculous peritonitis. Omentum already considerably thickened, firm and caseating. No visible tubercles in enlarged spleen, in liver or kidneys. Lungs congested and full of very minute scarcely visible grey tubercles. Tubercle bacilli found in rib marrow.
	,, ,,	,,	1· ,,	**514**	1,110	,,	15 ,,	Lesions similar to 513. Tuberculosis a little more advanced in peritoneum.
	,, ,,	,,	0·1 ,,	**515**	1,050	,,	52 ,,	Tuberculous peritonitis. Omentum of usual type. Cæcum adherent to abdominal wall by a solid caseous mass (injection partly intracæcal). Little tubercles in very attenuated pale spleen, and in liver. Lungs almost solid with translucent grey nodules containing large irregular yellow caseous patches.
	,, ,,	,,	0·01 ,,	**516**	760	,,	17 ,,	Slight tuberculous peritonitis. Omentum scarcely thickened. Organs normal. Death from causes other than tuberculosis.
H 31. "L.F." [Cervical glands.	Human cervical glands, direct.	5 weeks	1· mg.	**185**	2,970	,,	47 ,,	Tuberculous peritonitis, complicated by septic peritonitis. Spleen contained numerous small tubercles. Liver normal. Lungs solid with tubercles of various sizes, mostly confluent and forming a network of patches, with but little lung tissue between and that dark red with congestion.
	,, ,,	,,	0·1 ,,	**184**	3,050	,,	108 ,,	Inoculation subcutaneous. Large flattened caseous tumour in subcutaneous tissue at seat of inoculation. Peritoneum normal. One tubercle in spleen, and one in liver. Three large pearly tubercles projected from the surface of the left kidney, and there was one in the right; several smaller tubercles were seen in each. Lungs were solid and heavy; very little lung tissue remained, being replaced by large irregular caseous areas.

CULTURE INJECTIONS INTO RABBITS—*continued.* (*All Intraperitoneal.*)

CLASS II.—Slightly Virulent Viruses.

Virus, and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.
H 39. "M.B." [Cervical glands.]	Human cervical glands, direct.	3 months	50·0 mg.	**249**	1,400	Killed	91 days	Large caseous subperitoneal abscess at seat of inoculation. Few yellow streaks in omentum, and several translucent tubercles in lungs.
	,, ,,	,,	10·0 ,,	**248**	1,360	Died	35 ,,	Moderate number of small tubercles on omentum and peritoneum. One small tubercle in right kidney. Cause of death not determined.
	,, ,,	,,	1·0 ,,	**247**	1,360	Killed	91 ,,	Injection intramuscular. Caseous abscess in abdominal wall. Peritoneum normal. Few grey tubercles with opaque centres in lungs.
H 44. "D.C." [Cervical glands.]	Human cervical glands, direct.	5 months	50·0 mg.	**342**	970	Died	44 ,,	Tuberculous peritonitis, somewhat severe, but not such as one sees with a virulent virus. The omentum was thickened and red, and in its centre was a large collection of caseo-pus. There were few tubercles in kidneys, fewer in lungs.
	,, ,,	,,	5·0 ,,	**345**	900	Killed	90 ,,	Encysted caseous masses in peritoneal cavity. Purulent matter in pelvis of left kidney. One or two minute tubercles in lungs.
	,, ,,	,,	1·0 ,,	**346**	940	,,	90 ,,	Slight tuberculous peritonitis. One or two minute foci in lungs.
H 58. "F.G." [Cervical gland.]	Human cervical gland, through G.P. 1816.	2 months	1·0 mg.	**867**	850	,,	97 ,,	Normal throughout.
	,, ,,	,,	1·0 ,,	**868**	920	,,	97 ,	Small fibrous tubercle in abdominal wall at seat of inoculation only.
	Human lung, through G.P. 1812.	1 month	10·0 mg.	**823**	800	,,	97 ,,	Few minute fibrous tubercles in mesocolon and mesentery. Caseous nodules in omentum. Each kidney contained chronic fibrous tubercles, and a collection of caseous matter in the pelvis.
	,, ,,	,,	1·0 ,,	**822**	830	,,	97 ,,	Few fibrous tubercles on mesocolon, mesentery, omentum, and in kidneys.

CULTURE INJECTIONS INTO RABBITS—*continued.* (*All Intraperitoneal.*)

CLASS I.—Virulent Viruses.

Virus, and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.
H 31. "L.F." —*continued.* [Cervical glands]	Human cervical glands, direct.	14 months	10· mg.	**690**	2,000	Died	25 days	Severe tuberculous peritonitis. Omentum thickened and translucent, with caseous foci. Little tubercles faintly seen through capsule of spleen. None in liver. Many in kidneys. Lungs almost entirely solid, and peppered with minute white points.
	„ „	„	10· „	**691**	1,700	„	38 „	Injection partly intramuscular. Large caseous plaque in abdominal wall at seat of inoculation. Tuberculous peritonitis; omentum of the usual type. There were tubercles in the spleen and kidneys, none in liver. Lungs almost entirely consolidated, packed with tubercles with caseous centres.
	„ „	„	1· „	**692**	1,300	„	31 „	Slight tuberculous peritonitis. Omentum of the usual type. Spleen large and packed with small tubercles; only a few in kidneys, none in liver. Lungs almost entirely consolidated, with confluent grey tubercles with rather large caseous centres.
	„ „	„	1· „	**693**	1,400	„	26 „	Severe tuberculous peritonitis. Caseous omentum. Liver and spleen finely peppered with minute grey tubercles; a few only seen in kidneys. Lungs partly consolidated by grey tubercles with opaque whitish centres.
Origin of Virus: Human Tuberculosis, believed to be Primary in Cervical and Mesenteric Glands.								
H 38. "J.M." [Cervical and mesenteric glands.]	Human cervical glands through G.P. 793.	14 months	50· mg.	**252**	1,300	Died	15 days	Acute tuberculous peritonitis. Omentum showed innumerable minute tubercles; its free border was rolled up and contained numerous caseating foci. Spleen, liver, and kidneys apparently normal on section. Lungs healthy in colour; minute grey tubercles could just be made out, scattered over the surface.

CULTURE INJECTIONS INTO RABBITS—*continued.* (*All Intraperitoneal.*)

CLASS II.—Slightly Virulent Viruses.

Virus and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milli-grammes.	Number of Rabbit.	Weight in grammes.	Killed or Died.	Duration of life after inoculation.	Result.
Origin of Virus: Human Tuberculosis, believed to be Primary in Cervical and Mesenteric Glands.								
H 55. "R.D." [Cervical and mesenteric glands.]	Human mesenteric glands, direct.	3 months	10· mg.	**662**	1,500	Killed	93 days	Slight tuberculous peritonitis. Numerous small tubercles in kidneys and caseous matter in pelvis of each. Many minute grey tubercles in lungs.
	" "	"	1· "	**663**	1,370	Died	64 "	The peritoneum generally was roughened as if from chronic inflammation. Tubercle bacilli were numerous in a scraping from the surface. The omentum contained yellow tuberculous deposit, was drawn up but not greatly thickened. Few small translucent tubercles were seen in lungs. Death from causes other than tuberculosis.

CULTURE INJECTIONS INTO RABBITS—*continued.* (*All Intraperitoneal.*)

CLASS I.—Virulent Viruses.

Virus, and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.
H 38. "J.M." —*continued.* [Cervical and mesenteric glands.]	Human cervical glands, through G.P. 793.	14 months	10· mg.	**251**	1,350	Died	15 days	Acute tuberculous peritonitis. Omentum formed the usual solid mass, beset with caseous foci. Spleen, liver, and kidneys apparently normal on section. Lungs œdematous and pale; small irregular grey translucent areas, peppered with opaque specks, were thickly distributed over the organ.
	,, ,,	,,	1· ,,	**250**	1,170	,,	22 ,,	Severe tuberculous peritonitis. Omentum thickened and contained very numerous small caseous points. One kidney contained a single tubercle; none were seen in the substance of liver or spleen. Minute grey tubercles, with pin-point centres, could just be made out in the lungs, scattered thickly everywhere. The post-sternal glands were caseous.
	,, ,,	19½ months	10· mg.	**488**	1,120	,,	10 ,,	Lesions similar to 252; the lungs were congested in this animal.
	,, ,,	,,	1· ,,	**489**	1,010	,,	17 ,,	Lesions similar to 252, except that in this animal the lungs were congested, voluminous, and packed with small tubercles.
	,, ,,	,,	0·1 ,,	**490**	920	,,	19 ,,	Extensive tuberculous peritonitis. Dense caseous omentum. Very minute tubercles just visible in liver. Spleen and kidneys apparently normal. Lungs deeply congested, contained many little pale grey tubercles.
	,, ,,	,,	0·01 ,,	**491**	1,200	,,	23 ,,	Tuberculous peritonitis, not very severe. Omentum thickened and packed with caseating points. Liver showed innumerable minute grey points on its surface. Spleen and kidneys normal. Lungs contained a fairly large number of small opaque grey tubercles, and the right was a little congested.
Origin of Virus: Human Tuberculosis, believed to be Primary in Mesenteric Glands.								
H 7. "C.M." [Mesenteric glands.]	Calf 5, through G.P. 448.	20 months	10· mg.	**203**	1,630	Died	22 days	Severe tuberculous peritonitis. Omentum thickened, with caseating foci. Spleen, kidneys, and liver normal on section. Lungs extensively consolidated with tubercles so small and closely packed as to be almost invisible. Numerous tubercle bacilli were found in the spleen.

CULTURE INJECTIONS INTO RABBITS—*continued.* (*All Intraperitoneal.*)

CLASS II.—Slightly Virulent Viruses.

Virus, and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.
H 55. "R.D." —*continued.* [Cervical and mesenteric glands.]	Human mesenteric glands, direct.	3 months	1· mg.	**664**	1,300	Killed	93 days	Peritoneum roughened in consequence of old peritonitis. There was a small amount of tubercle in mesentery, mesocolon, and omentum. Few fibrous tubercles in kidneys one or two in lungs.
	" "	"	0·1 "	**665**	1,420	"	93 "	Slight tuberculous peritonitis. Many minute tubercles in each kidney, and caseous deposit in pelvis of left. Some little yellow tubercles in liver and spleen. Translucent tubercles in lungs.
H 63. "G.R." [Cervical and mesenteric glands.]	Human cervical glands, direct.	8 weeks	10· mg.	**869**	860	Died	20 "	Early milky tubercles on mesentery. Omentum red and œdematous, with yellow foci. Spleen swollen, no visible tubercles; tubercle bacilli found in scraping. Lungs œdematous; no definite tubercles; tubercle bacilli found. Death due to psorospermosis.
	" "	"	1· "	**870**	880	"	34 "	Severe tuberculous peritonitis complicated by severe psorospermosis.
	" "	"	1· "	**871**	850	Killed	96 "	Slight chronic tuberculosis of peritoneum. Few minute tubercles in each kidney and caseous matter in pelvis of right.
	Human mesenteric glands, direct.	8 weeks	1· "	**872**	950	Died	35 "	Small tubercles, moderately numerous, on mesentery and intestines. Omentum thickened and infiltrated with caseous streaks. Death due to psorospermosis.
	" "	"	1· "	**873**	860	Killed	96 "	Few minute fibrous tubercles on mesentery and omentum. Some rather large fibrous tubercles in each kidney.
	Human brain through G. P. 1877.	6 weeks	10· "	**875**	950	Died	21 "	Death from acute peritonitis.
	" "	"	1· "	**876**	1,000	Killed	92 "	Numerous caseous nodules in omentum, and fibro-caseous tubercles elsewhere in the peritoneal tissues. One tubercle in left kidney; softened caseous matter in pelvis of right.
	Origin of Virus: Human Tuberculosis, believed to be Primary in Mesenteric Glands.							
H 8. "S.C." [Mesenteric glands.]	Human mesenteric glands, direct.	27½ months	50· mg.	**294**	1,450	Died	12 days	No tuberculosis.
	" "	"	10· "	**293**	1,350	Killed	90 "	Thin-walled yellow pultaceous mass in right iliac fossa. Several similar smaller nodules in mesentery. Small yellow foci in omentum. One tuberculous infarct in left kidney.
	" "	"	1· "	**292**	1,600	"	90 "	Normal throughout.
	" "	"	0·1 "	**291**	1,300	"	90 "	" "

CULTURE INJECTIONS INTO RABBITS—*continued.* (*All Intraperitoneal.*)

CLASS I.—Virulent Viruses.

Virus, and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.
H 7. "C.M." —*continued.* [Mesenteric glands.]	Calf 5, through G.P. 448.	20 months	1· mg.	**202**	1,570	Died	27 days	Extensive tuberculous peritonitis. Omentum of usual type. The malpighian bodies in the spleen were white and larger than normal. Liver was thickly peppered with minute tubercles. Kidneys pale; no visible tubercles. Lungs contained numerous translucent tubercles, but were much less affected than is usual in cases where the duration of life is similar.
	,, ,,	,,	0·1 ,,	**201**	1,750	,,	55 ,,	Tuberculous peritonitis. Omentum of usual type. A considerable number of large grey tubercles, prominent, with yellow centres, were seen in the kidneys. In the spleen were a number of small grey tubercles, and there were many on the surface of the liver. The lung tissue was almost entirely replaced by large grey tubercles with yellow centres. Post-sternal glands enlarged and caseous.
	,, ,,	25 months	10· mg.	**408**	1,100	,,	16 ,,	Early tuberculous peritonitis. Omentum thickened, with caseating foci. No tubercles in substance of enlarged spleen or in liver; a few in one kidney. Lungs pink, consolidated, gelatinous; individual tubercles not visible.
	,, ,,	,,	1· ,,	**409**	1,200	,,	37 ,,	The peritoneal tissues were here and there studded with caseous plaques and patches. The omentum formed a fibro-caseous tumour of very large size. In it the spleen was incorporated, and it was adherent to surrounding tissues. The spleen was not obviously affected in its interior. One or two insignificant tubercles seen in kidneys; none in substance of liver. Lungs were bright red, very congested, and contained a moderate number of caseating tubercles.
	,, ,,	,,	0·1 ,,	**410**	1,020	Killed	94 ,,	Injection partly intramuscular and partly intracæcal. Caseous lesion in abdominal wall and in cæcum; caseating inguinal gland. Scarcely a trace of tuberculosis elsewhere in peritoneum. Some large chronic tubercles in each kidney and a good many fibro-caseous nodules in lungs.
	,, ,,	,,	0·01 ,,	**411**	1,130	Died	39 ,,	Tuberculous peritonitis. Omentum formed the usual caseating mass. Liver was marked by large and curved bands of caseous tissue, which seemed to have followed the course of parasitic lesions. Few small tubercles in each kidney. Lungs almost entirely consolidated with confluent tubercles, translucent with small caseous centres.
H 10. "B.S." [Mesenteric glands.]	Calf 113, through G.P. 757.	16½ months	10· mg.	**298**	1,390	,,	21 ,,	Severe tuberculous peritonitis. Lungs mottled, œdematous, without visible tubercles. Post-sternal and iliac glands caseous. Numerous tubercle bacilli in scrapings from lungs and spleen.

CULTURE INJECTIONS INTO RABBITS—*continued.* (*All Intraperitoneal.*)

CLASS II.—Slightly Virulent Viruses.

Virus, and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.
H 12. "H.N." [Mesenteric glands.]	Calf 363, direct	6 months	50· mg.	**246**	1,520	Killed	90 days	Large nodular collections of injected material in peritoneum. Many small tubercles in each kidney; caseo-purulent matter in pelvis of right. Few small tubercles in lungs.
	,, ,,	,,	10· ,,	**245**	1,350	,,	90 ,,	Small amount of yellow encysted deposit in peritoneum. Few tubercles in kidneys and lungs.
	,, ,,	,,	1· ,,	**244**	1,240	,,	90 ,,	Slight tuberculous peritonitis. Few tubercles in each kidney; caseo-purulent matter in pelvis of right. Many translucent nodules with small yellow foci in lungs.
H 18. "T.T." [Mesenteric glands.]	Calf 405, direct	8½ months	33· mg.	**285**	1,150	Died	25 ,,	Numerous small tubercles scattered over the peritoneal tissues; omentum thickened, and contained caseous deposit. Many small tubercles in kidneys.
	,, ,,	,,	10· ,,	**286**	1,300	Killed	89 ,,	Some nodules of encysted caseous matter in peritoneal cavity. Many small translucent tubercles in omentum. Fairly numerous small pale tubercles in kidneys.
	,, ,,	,,	1· ,,	**287**	1,320	,,	89 ,,	Many small translucent tubercles in omentum. One or two in each kidney.
	,, ,,	,,	0·1 ,,	**288**	1,020	,,	89 ,,	Ditto, but right kidney normal.
H 30. "E.M." [Mesenteric glands.]	Human bronchial and mesenteric glands, through G.P. 1337.	4½ months	50· mg.	**214**	2,290	Died	36 ,,	Acute tuberculous peritonitis. A few small tubercles in kidneys, one in lung.
	,, ,,	,,	10· ,,	**213**	1,720	Killed	88 ,,	Slight tuberculous peritonitis. Few tubercles in lungs and kidneys.
	,, ,,	,,	1· ,,	**212**	2,080	,,	88 ,,	Tuberculous peritonitis. Many tubercles in kidneys. Fibro-caseous tubercles in lungs. Tuberculosis of pregnant uterus.
H 36. "M.D." [Mesenteric glands.]	Human mesenteric glands, direct.	3 months	50· mg.	**347**	1,120	,,	90 ,,	Chronic tuberculous peritonitis. One minute tubercle in lung.
	,, ,,	,,	10· ,,	**348**	950	,,	90 ,,	Slight tuberculous peritonitis. Moderate number of tubercles in each kidney, and caseo-pus in the pelvis of the right. One or two minute foci in lungs.
	,, ,,	,,	1· ,,	**349**	1,020	,,	90 ,,	Few translucent yellow-centred tubercles in omentum; trace in mesentery.
H 57. "B.J." [Mesenteric glands.]	Human mesenteric glands, through G.P. 1802.	2½ months	10· mg.	**820**	1,490	,,	98 ,,	Slight chronic tuberculosis of peritoneum. Few fibrous tubercles in kidneys.
	,, ,,	,,	10· ,,	**821**	1,420	,,	98 ,,	Tuberculous abscess in cæcum. One little tubercle in lung. Injection intracæcal.
	Human lung through G.P. 1800.	3½ months	10· ,,	**860**	780	,,	105 ,,	Chronic tuberculosis of omentum. Abscess in abdominal wall. Injection partly intramuscular.
	,, ,,	,,	1· ,,	**861**	650	Died	1 ,,	No tuberculosis.

CULTURE INJECTIONS INTO RABBITS—*continued.* (*All Intraperitoneal.*)

CLASS I.—Virulent Viruses.

Virus, and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.
H 10. "**B.S.**" —*continued.* [Mesenteric glands.]	Calf 113, through G.P. 757.	16½ months	1· mg.	**297**	1,390	Died	23 days	Very severe tuberculous peritonitis. Liver and kidneys showed innumerable minute grey points. Lungs as in 298, but rather more advanced. Tubercle bacilli were numerous in bone marrow.
	,, ,,	,,	0·1 ,,	**296**	1,360	,,	44 ,,	Severe tuberculous peritonitis. Liver and spleen very thickly peppered with tubercles; there were a good many in each kidney. Lungs were almost consolidated with confluent tubercles with yellow centres.
	,, ,,	,,	0·01 ,,	**295**	1,270	,,	78 ,,	Large caseous tubercles on peritoneum. Omentum of usual type. Some small caseous tubercles in kidneys and a few in spleen. Lungs filled with large caseating tuberculous nodules.
	Calf 35, through G.P. 725.	2⅛ years	1· ,,	**735**	1,440	,,	12 ,,	Early tuberculous peritonitis. Thickened omentum. Lungs contained air, and were not enlarged; no visible tubercles. Liver, spleen, kidneys, normal. No cause of death found other than tuberculosis.
	,, ,,	,,	1· ,,	**736**	1,340	,,	18 ,,	Tuberculous peritonitis. Omentum thickened with tuberculous deposit. Lungs enlarged and packed with tubercles. No tubercles in abdominal organs. Death may have been hastened by severe psorospermosis of liver.
H 14. "**F.S.**" [Mesenteric glands.]	Human mesenteric glands, through G.P. 587.	16 months	10· mg.	**195**	2,150	,,	21 ,,	Early tuberculous peritonitis. Omentum rolled up into a firm mass. Some minute tubercles just visible in kidneys. Lungs heavy, filled with innumerable small grey translucent tubercles. Tubercle bacilli were found in spleen and liver, which appeared normal.
	,, ,,	,,	1· ,,	**194**	1,400	,,	29· ,,	Early tuberculous peritonitis. Omentum of usual type. The kidneys contained some tuberculous foci, and in the spleen the malphigian bodies were enlarged, and contained numerous tubercle bacilli. In the liver were some large cystic nodules, unlike tubercles, but which contained numerous tubercle bacilli. Lungs packed with little tubercles, largely confluent.
	,, ,,	,,	0·1 ,,	**193**	1,500	,,	57 ,,	Tuberculous peritonitis. Many tubercles in spleen and kidney, fewer in liver. Lungs full of large irregular caseous deposits, surrounded by a narrow zone of translucent fibrous tissue.
	,, ,,	19 months	10· mg.	**277**	1,330	,,	18 ,,	Very early tuberculous peritonitis. Lungs pink and solid; minute tubercles could be distinguished with a hand lens. Tubercle bacilli were found in scrapings from abdominal organs.

CULTURE INJECTIONS INTO RABBITS—*continued.* (*All Intraperitoneal.*)

CLASS II.—Slightly Virulent Viruses.

Virus, and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milli-grammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.

CULTURE INJECTIONS INTO RABBITS—*continued.* (*All Intraperitoneal.*)

CLASS I.—Virulent Viruses.

Virus, and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milli grammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.
H 14. "**F.S.**"—*continued.* [Mesenteric glands.]	Human mesenteric glands, through G.P. 587.	19 months	1· mg.	**278**	1,240	Died	23 days	Severe tuberculous peritonitis. Few small tubercles in kidneys. No tubercles in enlarged spleen, or in liver. Lungs pink, semi-solid, thickly peppered with minute tubercles.
	,, ,,	,,	0·1 ,,	**279**	1,300	,,	23 ,,	Similar to 278; kidneys and lungs a little more severely affected.
	,, ,,	,,	0·01 ,,	**280**	1,130	,,	29 ,,	Tuberculous peritonitis. Numerous small tubercles in liver and spleen, few in kidneys. Lungs solid, pink, packed with confluent yellow-centred tubercles.
	,, ,,	2 yrs. 3 mths.	1· ,,	**619**	690	,,	8 ,,	Scarcely anything to be seen on peritoneum; omentum partly consolidated. Few tubercle bacilli found in scrapings from apparently normal lung, liver, and spleen. Cause of death not determined.
	,, ,,	,,	1·	**621**	940	,,	14 ,,	Early tuberculous peritonitis. No tubercles seen in abdominal organs. Lungs full of little tubercles. Severe cysticercosis of omentum.
	,, ,,	,,	0·1 ,,	**620**	970	,,	25 ,,	Severe tuberculous peritonitis. Minute grey tubercles just visible on surface of liver, none in enlarged spleen; many in kidneys. Lungs contracted well, but were full of small tubercles.
	,, ,,	,,	0·1 ,,	**622**	670	,,	23 ,,	Similar to 620.
	Calf 895, direct.	2½ months	1· ,,	**770**	2,000	,,	24 ,,	Tuberculous peritonitis. Liver and spleen peppered with minute tubercles. Many small tubercles in kidneys. Lungs consolidated with confluent opaque-centred tubercles.
	,, ,,	,,	0·1 ,,	**771**	1,900	,,	94 ,,	Injection subcutaneous. Large tuberculous ulcer at seat of inoculation. Inguinal glands caseous. Lungs consolidated with confluent tubercles with caseous centres. Kidneys greatly enlarged, and packed with large fibro-caseous nodules which projected on the surface. Liver and spleen normal. There were some small ulcers in intestine, and tubercles in the mesenteric glands.
	,, ,,	,,	0·1 ,,	**772**	1,700	,,	33 ,,	General tuberculosis of the usual type. Liver, spleen, and lungs packed with tubercles.
H 19. "**S.W.**" [Mesenteric glands.]	Heifer 239, direct	10 months	10· ,,	**236**	2,120	,,	20 ,,	Severe tuberculous peritonitis. Few tubercles in liver, one or two in kidneys, none in spleen. Lungs contained very large numbers of minute tubercles. The post-sternal glands were enlarged and caseous.
	,, ,,	,,	1· ,,	**235**	1,950	,,	19 ,,	Similar to 236; in addition the spleen was peppered with small grey tubercles, and the lungs were more severely affected.

CULTURE INJECTIONS INTO RABBITS—*continued.* (*All Intraperitoneal.*)

CLASS II.—Slightly Virulent Viruses.

Virus, and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milli-grammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.

CULTURE INJECTIONS INTO RABBITS—*continued.* (*All Intraperitoneal.*)

CLASS I.—Virulent Viruses.

Virus, and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.
H 19. "S.W." —*continued.* [Mesenteric glands.]	Heifer 239, direct	10 months	0·1 mg.	**234**	2,000	Died	42 days	Tuberculous peritonitis. Liver contained a number of indistinct tubercles. Kidneys showed a moderate number, grey with opaque centres; there were a few on the surface of the spleen. Lungs showed numerous large prominent white-centred grey tubercles; the organ was heavy and voluminous.
	,, ,,	,,	0·01 ,,	**233**	2,250	,,	32 ,,	Tuberculous peritonitis. Tubercles were somewhat numerous on surface of spleen, scanty on section. Liver ditto. Large numbers of grey yellow-centred tubercles projected from the surface of the kidneys. Lungs large and voluminous; the whole surface was covered with grey opaque-centred tubercles. There were several tubercles on the heart.
	Goat 11, direct -	1 yr. 6 mths.	10· mg.	**607**	1,120	,,	9 ,,	Acute tuberculous peritonitis. Omentum formed the usual caseating mass. No visible disease of organs. Few tubercle bacilli were found in the rib marrow.
	,, ,,	,,	1· ,,	**608**	820	,,	17 ,,	Tuberculous peritonitis. Omentum formed a small caseating tumour. Lungs collapsed moderately well, and contained many small tubercles. No tuberculosis elsewhere.
	,, ,,	,,	1· ,,	**609**	920	,,	6 ,,	Death probably due to cysticercosis.
	,, ,,	,,	0·1 ,,	**610**	870	,,	24 ,,	Tuberculous peritonitis. Few tubercles in spleen, none in kidneys or liver. Many small tubercles in lungs.
H 20. "F.L." [Mesenteric glands.]	Calf 213, direct -	8 months	10· mg.	**200**	1,870	,,	17 ,,	Early tuberculous peritonitis. Omentum of the usual type. Lungs large, œdematous, sticky, almost entirely consolidated, and crammed with little tubercles. Tubercle bacilli found in scrapings from apparently normal spleen and kidney.
	,, ,,	,,	1· ,,	**199**	2,050	,,	18 ,,	Ditto.
	,, ,,	,,	0·1 ,,	**198**	2,100	,,	30 ,,	Extensive tuberculous peritonitis. Omentum of the usual type. Liver and spleen full of innumerable very minute tubercles; numerous tubercles seen in kidneys. Lungs large and heavy, almost entirely consolidated with tubercles of the usual type. Numerous tubercles seen in muscular tissue of heart.
	,, ,,	17 months	10· mg.	**571**	1,810	,,	18 ,,	Severe tuberculous peritonitis. A few minute tubercles in liver. Lungs large and partly consolidated, packed with small tubercles. Tubercle bacilli numerous in apparently normal spleen, and in rib marrow.

CULTURE INJECTIONS INTO RABBITS—*continued.* (*All Intraperitoneal.*)

CLASS II.—Slightly Virulent Viruses.

Virus, and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milli-grammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.

CULTURE INJECTIONS INTO RABBITS—*continued.* (*All Intraperitoneal.*)

Class I.—Virulent Viruses.

Virus, and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.
H 20. "F.L." —*continued.* [Mesenteric glands.]	Calf 213, direct -	17 months	1· mg.	**572**	1,430	Died	25 days	Severe tuberculous peritonitis. Few tubercles in kidneys. Lungs packed with small tubercles. Tubercle bacilli found in enlarged liver and spleen.
	„ „	„	1· „	**573**	1,480	„	19 „	Similar to 572; except that in this animal no tubercles were visible in the kidneys.
	„ „	„	0·1 „	**574**	1,220	„	25 „	Similar to 572.
H 32. "Y.W." [Mesenteric glands.]	Human mesenteric glands, direct	3 months	1· mg.	**221**	2,200	„	21 „	Acute tuberculous peritonitis. Some small tubercles on surface of liver. A few scarcely visible in each kidney. Lungs extremely consolidated and packed with little tubercles.
	„ „	„	0·1 „	**220**	2,410	„	30 „	Acute extensive tuberculous peritonitis. Numerous tubercles in liver, spleen, and kidneys. Lungs solid and heavy, almost entirely composed of grey confluent tubercles with opaque centres. A few tubercles were seen in pericardium.
	Human bronchial glands, through Rabbit 166	6 months	10· mg.	**497**	1,050	„	32 „	Injection partly intracæcal. Large caseous ulcer in cæcum corresponding to the seat of injection. Tuberculous peritonitis. Numerous minute tubercles in liver and kidneys; none in spleen. Lungs as in 220.
	„ „	„	1· „	**498**	1,220	„	12 „	Very early tuberculous peritonitis. Numerous minute dark grey tubercles in lungs. Death probably acclerated by psorospermosis.
	„ „	„	0·1 „	**499**	1,200	„	15 „	Early tuberculous peritonitis. Lungs bright red; numerous little tubercles could be indistinctly made out. No tubercles visible in liver, kidneys or enlarged spleen.
	„ „	„	0·01 „	**500**	1,050	„	27 „	Early tuberculous peritonitis. Numerous minute tubercles in liver and spleen, a few in kidneys. Lungs as in 220.
H 49. "T.C."† [Mesenteric glands.]	Human mesenteric glands, direct	2 months	50· mg.	**448**	1,420	„	39 „	There were a good many translucent tubercles with yellow centres on mesentery and cæcum. Omentum contained caseous nodules of various sizes. A few tubercles were seen in kidneys; and a good many, translucent with small caseous centres, in lungs. Cause of death not determined.
	„ „	„	10· „	**449**	1,010	„	69 „	Numerous caseous tubercles in peritoneum. Omentum large, solid, and caseous. Lungs full of caseous nodules. Many tubercles in kidneys; none in liver and spleen.

† This virus increased in virulence after passage through calves.

CULTURE INJECTIONS INTO RABBITS—*continued.* (*All Intraperitoneal.*)

CLASS II.—Slightly Virulent Viruses.

Virus, and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.

CULTURE INJECTIONS INTO RABBITS—*continued.* (*All Intraperitoneal.*)

CLASS I.—Virulent Viruses.

Virus, and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.
H 49. "T.C."† —*continued.* [Mesenteric glands.]	Human mesenteric glands, direct.	2 months	1· mg.	**450**	1,180	Died	87 days	Very extensive caseous plaques on various peritoneal tissues. Few small tubercles in each kidney. Lungs contained very large caseous patches, with the intervening tissue much congested.
	,, ,,	,,	0·1 ,,	**451**	1,260	,,	79 ,,	Small translucent tubercles with yellow centres in omentum—no thickening. Peritoneum normal. Lungs packed with large irregular confluent masses, grey and translucent at the edges, extensively caseous in the centres. Kidneys packed with large white prominent tubercles.
	,, ,,	7 months	10· ,,	**658**	1,300	,,	35 ,,	Severe tuberculous peritonitis. Many minute grey tubercles in kidneys. Many small scattered fibrous yellow-centred tubercles in lungs.
	,, ,,	,,	1· ,,	**659**	1,550	,,	59 ,,	Tuberculous peritonitis; some caseous nodules in omentum. Kidneys studded all over with large projecting grey nodules with irregular caseous centres. Lungs largely consolidated by confluent fibrous tubercles peppered with yellow foci.
	,, ,,	,,	1· ,,	**660**	1,610	,,	88 ,,	Similar to 659; in addition both testes were enlarged and caseous throughout.
	,, ,,	,,	0·1 ,,	**661**	1,230	,,	60 ,,	Numerous caseous tubercles and plaques on various peritoneal tissues. Omentum formed an enormous caseous mass, adherent to everything in its neighbourhood. Moderate number of tubercles in kidneys. Lungs contained large irregular caseous tubercles, but there was a good deal of air-containing tissue.
H 59. "L.B." [Mesenteric glands.]	Human mesenteric glands, through G.P. 1849	2 months	1· ,,	**895a**	2,150	,,	34 ,,	Extensive tuberculous peritonitis. Few indistinct foci in kidneys. Spleen enlarged, no visible tubercles, but tubercle bacilli numerous in a scraping from the pulp. Lungs were largely consolidated and deeply congested, and contained numerous little pale grey tubercles. Thoracic glands caseous.
	,, ,,	,,	0·1 ,,	**896a**	2,360	Killed when dying.	34 ,,	Tuberculous peritonitis. Few minute tubercles in kidneys. Spleen packed with small caseating tubercles. Liver contained similar tubercles. Yellow tubercles, about 1 mm. in diameter, were sparsely scattered throughout the lungs, which everywhere contained air. Bronchial glands large and caseous.
	Human cervical glands, direct	2 months	1· ,,	**846**	870	Died	18 ,,	Many small tubercles on peritoneum. Omentum slightly thickened. Innumerable very minute tubercles visible in spleen and liver, and a few in the kidneys. Lungs congested, consolidated, and contained many tubercles.

† This virus increased in virulence after passage through calves.

CULTURE INJECTIONS INTO RABBITS.—*continued.* (*All Intraperitoneal.*)

CLASS II.—Slightly Virulent Viruses.

Virus, and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milli-grammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.

CULTURE INJECTIONS INTO RABBITS—*continued.* (*All Intraperitoneal.*)

CLASS I.—Virulent Viruses.

Virus, and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.
H 59. "L.B." —*continued.* [Mesenteric glands.]	Human cervical glands, direct.	2 months	0·1 mg.	**847**	1,100	Died	69 days	Large tubercles were scattered over the peritoneal tissues. Omentum showed a moderate amount of caseous deposit. There were numerous large tubercles in kidneys. Spleen enormously enlarged, packed with caseous tubercles. Lungs almost entirely consolidated by tubercles of the usual type.
	Human lung, direct	1½ months	1· mg.	**824**	1,140	,,	22 ,,	Tuberculous peritonitis. Omentum of the usual type. Spleen contained minute barely visible tubercles; a few were seen in the kidneys. Tubercle bacilli were found in a scraping from the liver, which appeared normal. Numerous early tubercles were visible in the lungs, which were not consolidated.
	,, ,,	,,	0·1 ,,	**825**	1,350	,,	70 ,,	Injection partly subcutaneous. Caseous lesion in subcutaneous tissue of abdominal wall. Tuberculous peritonitis, moderately severe. Kidneys showed a few large grey tubercles with caseous centres. Lungs were to a large extent consolidated by tuberculous nodules with caseous centres. Bronchial glands much enlarged and caseous. Spleen and liver normal on section.
	Human brain, through G.P. 1860	2 months	1· mg.	**858**	770	,,	23 ,,	Early tuberculous peritonitis. Numerous little tubercles visible in liver, spleen, and kidneys. Lungs consolidated, full of minute grey tubercles. Bronchial glands caseous.
	,, ,,	,,	0·1 ,,	**859**	620	,,	48 ,,	Injection largely intracæcal. Extensive tuberculous ulceration of cæcum. Slight tuberculous peritonitis. Kidneys contained a moderate number of grey yellow-centred tubercles; so also did the lungs. There were none in spleen or liver.
H 64. "M.G." Mesenteric [glands.]	Human mesenteric glands, through G.P. 1910.	2 months	8· mg.	**928**	1,650	,,	91 ,,	Injection partly intramuscular and intracæcal. Caseous nodule in abdominal wall; nearest glands caseous. In the wall of the cæcum was an ulcerated caseous nodule. The spermatic cord and the testicle on each side formed a solid tumour, caseating throughout. Tuberculous peritonitis, not severe. Kidneys contained numerous caseating nodules of various sizes. There were a few greyish points in the liver. Spleen normal. Lungs were closely beset with irregular caseous nodules. There were flattened tuberculous plaques on the pleura. The thoracic glands were caseous.
	,, ,,	,,	1· ,,	**929**	1,620	,,	25 ,,	Acute miliary tuberculosis of peritoneum. Numerous miliary tubercles in spleen and kidneys. Lungs consolidated and packed with small tubercles. Thoracic glands caseous.

CULTURE INJECTIONS INTO RABBITS—*continued.* (*All Intraperitoneal.*)

CLASS II.—Slightly Virulent Viruses.

Virus, and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milli-grammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.

CULTURE INJECTIONS INTO RABBITS—*continued.* (*All Intraperitoneal.*)

CLASS I.—Virulent Viruses.

Virus, and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.
H 64. "M.G." (*continued.*) [Mesenteric glands.]	Human mesenteric glands, through G.P. 1910.	2 months	1· mg.	**930**	1,700	Died	21 days	Acute tuberculous peritonitis. No tubercles in substance of liver, spleen, and kidneys. Lungs contained a moderate number of small grey tubercles with white centres. Thoracic glands caseating.
	,, ,,	,,	0·1 ,,	**931**	1,550	,,	34 ,,	Severe tuberculous peritonitis. Innumerable miliary tubercles in spleen, liver, kidneys, and lungs.
H 65. "K.B." [Mesenteric glands.]	Human mesenteric glands, through G.P. 1835.	$3\frac{2}{3}$ months	10· mg.	**923**	1,070	,,	17 ,,	Innumerable tubercles on peritoneum. Lungs mottled with a translucent grey network, composed of very minute tubercles. Bronchial glands caseous.
	,, ,,	,,	1· ,,	**922**	920	,,	28 ,,	Tuberculous peritonitis. Tubercles just visible in spleen; fairly numerous in kidneys; none visible in liver. Lungs packed with confluent tubercles.
	,, ,,	,,	1· ,,	**921**	1,050	,,	30 ,,	Severe tuberculous peritonitis. Spleen packed with small tubercles. Numerous minute tubercles in each kidney. Lungs almost entirely consolidated with confluent tubercles. Thoracic glands enlarged and caseous.
	,, ,,	,,	0·1 ,,	**920**	1,130	,,	28 ,,	Early tuberculous peritonitis. Many small tubercles in cortex of each kidney. Lungs as in 921. Liver and spleen appeared normal.

Origin of Virus: Human Tuberculosis, believed to be Primary in Joints.

CULTURE INJECTIONS INTO RABBITS—*continued.* (*All Intraperitoneal.*)

CLASS II.—Slightly Virulent Viruses.

Virus, and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.
Origin of Virus: Human Tuberculosis, believed to be Primary in Joints.								
H 9. "C.T." - [Wrist joint.]	Calf 201, through G.P. 1081.	10½ months	50· mg.	**332**	740	Died	13 days	Innumerable scarcely visible tubercles on mesentery. Numerous small yellow collections in omentum which was not thickened. No definite tubercles in organs, but tubercle bacilli numerous in liver, spleen, and rib marrow (General tuberculosis in very young animal, ? complicated).
	,, ,,	,,	10· ,,	**333**	720	Killed	88 ,,	Slight tuberculous peritonitis. Very few fibrous yellow-centred tubercles in lungs.
H 11. "E.D." - [Elbow joint.]	Calf 309, through G.P. 1298.	8½ months	50· ,,	**350**	980	Died	22 ,,	Milky tuberculous deposit on peritoneal tissues. Omentum thickened and full of caseating foci. Few small tubercles in each kidney. Tubercle bacilli (scanty) in smears from spleen and rib marrow.
	,, ,,	,,	10· ,,	**351**	1,150	Killed	90 ,,	Slight tuberculous peritonitis. Some grey tubercles in each kidney, and a caseo-purulent deposit in pelvis of right.
	,, ,,	,,	1· ,,	**352**	1,050	,,	90 ,,	Slight tuberculous peritonitis. Few translucent tubercles in each kidney.

CULTURE INJECTIONS INTO RABBITS—*continued.* (*All Intraperitoneal.*)

CLASS I.—Virulent Viruses.

Virus, and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milli-grammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.

CULTURE INJECTIONS INTO RABBITS—*continued.* (*All Intraperitonal.*)

CLASS II.—Slightly Virulent Viruses.

Virus, and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.
H 15. "I.W." [Ankle joint.]	Calf 413, direct	3 months	10·0 mg.	**390**	900	Killed	91 days	Slight tuberculous peritonitis. Few small tubercles in lungs. Some wedge-shaped tubercles in cortex of each kidney.
	" "	"	1·0 "	**391**	950	"	91 "	No tuberculosis.
H 16. "J.H."* [Knee joint.]	Human synovial membrane, through G.P. 609.	14 months	10·0 mg.	**173**	2,770	"	95 "	Slight tuberculous peritonitis, widely distributed. Two small tubercles in liver. Two in left kidney, and tuberculous pyelitis in the right. Many dark pin-point tubercles in lungs.
	" "	"	1·0 "	**172**	1,720	"	95 "	Few small translucent tubercles only, scattered over the peritoneal tissues. Four small fibrous tubercles in lungs.
	" "	"	0·1 "	**171**	2,070	"	95 "	Slight tuberculous peritonitis. Three small fibro-caseous tubercles in lungs.
H 41. "A.S."- [Knee joint.]	Human synovial membrane, through G.P. 1435.	2½ months	50·0 mg.	**318**	750	"	89 "	Several caseous masses, large and small, encysted in peritoneal cavity. The pelves of both kidneys contained caseo-purulent matter. Few insignificant tubercles in lungs.
	" "	"	10·0 "	**319**	850	"	89 "	Slight tuberculous peritonitis. Each kidney contained caseous matter in the pelvis, and many translucent tubercles in the cortex. In the lungs were fibrous patches and small translucent tubercles the former containing caseous foci.
	" "	"	1·0 "	**320**	850	"	89 "	Very slight tuberculous peritonitis. A single small tubercle in one kidney.
H 42. "M.R." [Ankle joint.]	Human synovial membrane, etc., through G.P. 1447.	3 months	50·0 mg.	**321**	1,300	"	89 "	In the peritoneal cavity, attached to various tissues, were lobulated masses of softened caseous matter enclosed in a thin membrane. There was no tuberculosis elsewhere.
	" "	"	10·0 "	**322**	1,220	"	89 "	Ditto.
	" "	"	1·0 "	**323**	1,170	"	89 "	Small number of insignificant tubercles in peritoneum and omentum only.
H 43. "F.F."- [Knee-joint]	Human synovial membrane, direct.	5 months	50·0 mg.	**324**	1,450	"	89 "	Numerous encysted masses of caseous material in various peritoneal tissues. Numerous small fibrous tubercles in kidneys, and some caseo-pus in pelvis of right. One fibrous lesion in lung.
	" "	"	50·0 "	**326**	1,300	Died	27 "	Early tuberculous peritonitis. Small milky tubercles on peritoneal tissues; omentum thickened, with opaque foci. Tubercle bacilli found in spleen, liver, kidney, lung, and rib marrow.
	" "	"	10·0 "	**327**	870	"	26 "	Acute tuberculous peritonitis. Typical early tubercles on various peritoneal tissues. Omentum red, slightly thickened, and packed with small tubercles. No tubercle bacilli found in abdominal or thoracic organs. Death was probably due to another infection.

* This virus increased in virulence after passage through Calves.

CULTURE INJECTIONS INTO RABBITS—*continued.* (*All Intraperitoneal.*)

CLASS I.—Virulent Viruses.

Virus, and primary probable seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milli-grammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.
Origin of Virus: Human Tuberculosis, believed to be Primary in Kidney.								
Origin of Virus: Human Tuberculosis, believed to be Primary in Testicle.								

CULTURE INJECTIONS INTO RABBITS—*continued.* (*All Intraperitoneal.*)

CLASS II.—Slightly Virulent Viruses.

Virus, and probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.
H 46. "H.W." [Knee-joint.]	Caseous material from human patella through G.P. 1,444.	3¼ months	50·mg.	374	930	Killed	90 days	Very slight tuberculous peritonitis. One small tubercle in left kidney, a few in lungs.
	,, ,,	,,	10· ,,	375	1,000	,,	90 ,,	Very slight tuberculous peritonitis. Some prominent white tubercles on the surface of each kidney. A few translucent tubercles in lungs.
	,, ,,	,,	1· ,,	376	1,000	,,	90 ,,	Uterus full of tuberculous pus (injection possibly made into the uterus.) Very slight tuberculous peritonitis. Wedge-shaped tubercles in the cortices of the kidneys. Few yellow-centred translucent tubercles in lungs.
H. 47. "S.B." - [Hip-joint.]	Diseased human tissues, through G.P. 1430.	4½ months	50·mg.	415	1,250	Died	57 ,,	Few small soft collections of caseous matter in peritoneal cavity. The pelvis of the right kidney contained pus. Cause of death not determined.
	,, ,,	,,	10· ,,	416	1,180	Killed	89 ,,	Slight tuberculous peritonitis. Lungs rather full of translucent tubercles with yellow centres. Uterus distended with creamy pus, swarming with tubercle bacilli.
	,, ,,	,,	1· ,,	417	970	,,	89 ,,	Few yellow tubercles in omentum, one or two minute tubercles in lungs.
66. "W.C." [Lumbar vertebræ.]	Discharge from Lumbar abscess, through G.P. 1911.	1½ months	8·mg.	915	1,920	,,	91 ,,	Tuberculosis of peritoneum, kidneys, portal and cœliac glands. One tubercle in lung.
	,, ,,	,,	1· ,,	916	1,800	,,	91 ,,	Few grey translucent tubercles in various peritoneal tissues, rather numerous in omentum. No tuberculosis elsewhere.
	,, ,,	,,	1· ,,	917	1,620	,,	91 ,,	Slight tuberculous peritonitis. Two wedge-shaped tubercles in right kidney; three small translucent tubercles in lungs.
	Origin of Virus: Human Tuberculosis, believed to be Primary in Kidney.							
26. "K.M." [Kidney.]	[*Not injected.*]							
	Origin of Virus: Human Tuberculosis, believed to be Primary in Testicle.							
40. "J.G." [Testicle.]	Human testicle, through G.P. 1439.	1½ months	50·mg.	255	1,280	Killed	90 ,,	Slight tuberculous peritonitis. Fairly numerous tubercles in both kidneys, and caseous pus in the pelvis of the right. Tuberculous disease of left epididymus. Two small tubercles in lungs.
	,, ,,	,,	10· ,,	254	1,080	,,	90 ,,	Ditto; but epididymus normal.
	,, ,,	,,	1· ,,	253	1,080	,,	90 ,,	Slight tuberculous peritonitis. There was the usual collection of pus in the right kidney. Rather numerous grey yellow-centred tubercles in lungs.

CULTURE INJECTIONS INTO RABBITS—*continued.*

INTRAPERITONEAL INOCULATION OF SMALL DOSES OF CULTURE.

Class I.—Virus virulent for Bovines.

VIRUS H 32. "Y.W."

[Strain, 1 year 8 months old, derived from human mesenteric glands, direct.]

Dose in milligrammes.	Number of Rabbit.	Weight in grammes.	Killed or died.	Duration of life in days.	Result.
0·0001	888	1,100	Died.	49 days	Tuberculous peritonitis. Omentum caseous. Lungs almost entirely consolidated by confluent tubercles. The thoracic glands were large and caseous. Tubercles were numerous in kidneys and spleen. The liver contained no definite tubercles.
0·00001	893	1,140	„	34 „	Tuberculous peritonitis. Omentum thickened and caseous. The spleen and kidneys contained numerous small tubercles, grey with opaque centres. The lungs were to a large extent consolidated by confluent grey tubercles. Bronchial glands caseating.
0·000001	894	870	„	53 „	Tuberculous peritonitis. Omentum very large, solid, and caseous. Tubercles in spleen. Numerous tubercles in kidneys. Lungs packed with confluent tubercles. Thoracic glands caseous. A few tubercles in mesenteric glands.
0·0000001	896	850	„	76 „	Tuberculous peritonitis. Omentum large and caseous. In the cortex of each kidney were prominent tubercles. In the spleen were a few small tubercles. The lungs were consolidated with confluent tubercles. The thoracic glands were caseous.
0·0000001	897	800	„	69 „	Tuberculous peritonitis. Omentum a large caseous mass. Many large prominent tubercles in kidneys. Lungs almost entirely consolidated by confluent tubercles.

CULTURE INJECTIONS INTO RABBITS.—*continued.*

CLASS III.—Virus not susceptible of being placed either in Class I. or II.

Origin of Virus: Human tuberculosis, believed to be primary in skin (Lupus).

Intraperitoneal Injections.

Virus.	Immediate Source of Culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Rabbit.	Weight in grammes.	Killed or Died.	Duration of Life after Inoculation.	Result.
H 53. "D.H."	Diseased tissue, through G.P. 1482.	8½ months	10· mg.	**627**	2,880	Died	18 days	Early tuberculous peritonitis. Lungs congested and œdematous, contained innumerable minute grey tubercles. A few tubercle bacilli found in scraping from enlarged spleen, none in liver or kidneys. Severe cysticercosis.
	„ „	„	1·	**628**	2,350	„	29 „	Severe tuberculous peritonitis. Omentum of the type usually seen in rabbits injected with viruses of Group I. Numerous minute tubercles in liver, spleen, kidneys, and lungs. In the latter they were confluent, and the organ was largely consolidated.
	„ „	„	1·	**629**	2,450	„	35 „	Severe tuberculous peritonitis. Omentum of the usual type. Numerous little tubercles in liver, spleen, and kidneys. Lungs packed with confluent grey tubercles with minute caseating centres.
	„ „	„	0·1	**630**	1,720	„	55 „	Few translucent tubercles with yellow centres on peritoneal tissues; omentum large, solid, translucent, containing yellow foci (chronic tuberculous peritonitis.) Minute grey tubercles in liver. Numerous small tubercles with minute yellow centres in kidneys. Lungs largely consolidated by confluent grey tubercles.
	„ „	14½ months	10· mg.	**830**	990	„	14 „	Very early tuberculous peritonitis. Spleen enlarged, no visible tubercles; lungs consolidated, ditto. Tubercle bacilli found in liver, spleen, and lungs.
	„ „	„	1·	**831**	890	„	46 „	Severe tuberculous peritonitis. Some small tubercles, a few with caseous centres, in kidneys. None in spleen or liver. Moderate number of little tubercles in lungs, dark and translucent, with small caseating foci. Bronchial glands caseous. The anterior parts of the lungs were collapsed (? cause). Psorospermosis of liver.
	„ „	„	0·1	**832**	920	„	74 „	Numerous prominent yellow tubercles studded the peritoneal tissues. Omentum packed with caseating tubercles. Numerous tubercles seen in cortex of kidneys, some wedge-shaped. Lungs largely consolidated with confluent tubercles of the usual type. Caseous tubercles, crowded with tubercle bacilli, occurred in the rib marrow.

CULTURE INJECTIONS INTO RABBITS—*continued.*

CLASS III.—Virus not susceptible of being placed either in Class I. or II.—*continued.*

Origin of Virus: Human tuberculosis, believed to be primary in skin (Lupus).—*continued.*

Intraperitoneal Injections.—continued.

Virus.	Immediate Source of Culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Rabbit.	Weight in Grammes.	Killed or Died.	Duration of Life after Inoculation.	Result.
H 53. "D.H." —*continued.*	Calf 905, direct -	2½ months	1· mg.	**818**	1,720	Died	46 days	Very severe tuberculous peritonitis. Severe early tuberculosis of spleen and kidneys, liver less affected. Lungs consolidated, gelatinous, packed with tubercles.
	„ „	„	0·1	**817**	1,470	„	63 „	Peritoneal tissues thickly peppered with prominent whitish tubercles. Few tubercles in spleen, none in liver. Caseous streaks were seen in the medulla of the kidneys. Lungs thickly infiltrated with large confluent tubercles and nodules of the usual type.
	„ „	„	0·01	**816**	1,520	„	131 „	Tuberculous peritonitis of a chronic type. Large caseous patches in both testes. Two little tubercles in spleen, a moderate number in kidneys. A moderate number of grey nodules with caseous centres in lungs, only a small portion of which are consolidated. There was scarcely enough tuberculosis to account for death.

FEEDING EXPERIMENTS ON RABBITS.

CLASS I.—Viruses virulent for Bovines.

CULTURES.

I. Virus H. 59 "L.B."

Culture derived from human brain, through Guinea-pig 1860.

Dose in milligrammes.	Number of Rabbit.	Weight in grammes.	Killed or Died.	Duration of life in days.	Result.
10	**937**	1,620	Killed	51 days	General Tuberculosis. Tonsils caseous throughout. Pharynx normal. Glands of the neck and throat enlarged and beset with caseous tubercles. All the Peyer's patches in the small intestine contained numerous caseous foci. The mucous membrane over a few at the anterior end had ulcerated, and the ileum was extensively ulcerated. The terminal dilated portion of the ileum and the vermi form appendix were closely beset with small yellow foci; no ulceration. The enlarged mesenteric glands were closely beset with caseating patches, often confluent. The spleen appeared normal. The liver contained one small doubtful tubercle, and there were three in the right kidney. The lungs contained large caseous masses with narrow grey margins; in the crepitant lung tissue between were caseous miliary tubercles. Bronchial glands enlarged and largely caseous.
10·	**938**	2,520	Died	74 days	General Tuberculosis. Both tonsils were caseous and ulcerated. The glands of the neck and throat contained caseous nodules or were caseous throughout. In the larynx and trachea was a quantity of caseo-pus and the mucous membrane of the former was ulcerated. There were numerous ulcers, mostly small, in the small intestine. These had caseous floors, and thick caseous bases which projected from the serous surface. There were also numerous firm caseous nodules in the terminal dilation of the ileum and in the vermiform appendix. The enlarged mesenteric glands were largely composed of dense white caseous tissue. One tubercle was found in the spleen; no definite tubercles were seen in the liver. There was a moderate number of grey tubercles in each kidney, the larger showing central caseation. The anterior lobes of the lungs were consolidated. Evenly distributed through the organ were numerous caseous tubercles; there were also many large firm caseous masses. There was much caseo-pus in the bronchi. The bronchial glands were caseous.
1·	**939**	2,000	Died	37 days	Death due to cirrhosis of the liver. Four Peyer's patches in the ileum contained numerous discrete yellow foci, not ulcerated. In the terminal dilation of the ileum and in the appendix were many smaller foci. The mesenteric glands, not enlarged, contained scattered caseous foci. There were half a dozen caseous nodules of various sizes (up to that of a split pea) in the lungs, and also a few small grey tubercles. In the left bronchial gland was a small tubercle. No tuberculosis elsewhere.
1·	**940**	2,070	Killed	90 days	Tuberculosis. Right tonsil caseous. Pharynx normal. Glands of the throat caseous. In the ileum were several groups of firm caseating nodules; there were a few in the anterior part of the small intestine. Numerous yellow foci were seen in the appendix and the dilated end of the ileum; the mucous membrane over some of the latter had ulcerated. In the descending colon were a few caseous nodules. Several of the mesenteric glands were enlarged, indurated, and contained scattered caseous foci. In the omentum were a few minute tubercles. In each kidney were one or two tubercles. Spleen, liver and portal glands normal. The lungs were crepitant, and contained some grey miliary tubercles with caseous centres, and about ten caseous nodules up to the size of a pea. Bronchial glands normal.

FEEDING EXPERIMENTS ON RABBITS—*continued.*

Class I.—Viruses virulent for Bovines.

II. Virus H 64. "M.G."

Culture derived from human brain, through Guinea-pig 1880.

Dose in milligrammes.	Number of Rabbit.	Weight in grammes.	Killed or Died.	Duration of life in days.	Result.
10·	**941**	2,100	Killed	53 days	General Tuberculosis. The right tonsil was partly caseous. The right submaxillary and cervical glands contained caseous tubercles or caseous areas. The corresponding glands on the left side were normal. The small intestine was very severely affected, showing throughout its whole length extremely numerous raised nodules beginning to ulcerate, and in addition several larger ulcers with thick raised floor and caseous base. There was a smaller number of similar lesions in the large intestine. The enlarged mesenteric glands showed extensive patches of caseation: some of the colic glands contained caseous foci. The spleen showed one Malpighian body more opaque and yellow than the others; this contained tubercle bacilli. In the liver were sparsely scattered miliary tubercles. The kidneys showed a few tubercles. The lungs were crepitant and showed sparsely scattered caseating miliary tubercles, and also four larger caseous nodules. The bronchial glands contained caseous foci.
10·	**942**	2,150	„	91 „	General Tuberculosis. Both tonsils were caseous. Nearly all the glands of the neck and throat were enlarged and caseous. Ulceration and caseation of mucous membrane was seen below each vocal cord. Along the whole length of the small intestine were firm caseating nodules commencing to ulcerate, some as large as a split pea, and also several large ulcers. The lymphoid tissue of the vermiform appendix and dilated portion of the ileum was extensively replaced by caseous patches, the mucous membrane over which was ulcerated. In the large intestine also were numerous ulcerated nodules. On the omentum were numerous minute grey tubercles. In the liver there was one tubercle. The spleen was normal. In each kidney were half-a-dozen grey miliary tubercles. The lungs were crepitant and contained moderately numerous grey caseating nodules up to a pea in size, and also several large caseous masses. Bronchial glands caseous. On the pleura were about a dozen fibroid nodules.
1·	**943**	2,350	„	53 „	Slight General Tuberculosis. Pharynx and tonsils appeared normal. The right submaxillary and both mid-cervical glands were largely caseous. One Peyer's patch in the anterior part of the intestine, and most of those in the ileum, contained small caseous patches, the majority of which were ulcerated. In the terminal portion of the ileum and appendix were numerous soft caseous foci. The posterior mesenteric glands contained caseous foci, the anterior glands were with one exception [which contained a caseous focus] normal. Spleen and liver normal. One minute tubercle in right kidney. In the lungs were three large caseous nodules and a few scattered grey tubercles with small caseous centres. The bronchial glands contained a few caseous foci. The pleura and peritoneum were normal.
1·	**944**	1,740	„	91 „	General Tuberculosis. One tonsil was caseous. Some of the glands of the neck and throat were caseous, others were normal. Along the whole length of the small intestine were scattered caseous nodules, over the majority of which the mucous membrane was more or less ulcerated, and in the jejunum was a large ulcer with caseous floor and thick raised margins. In the vermiform appendix were a few gritty caseous nodules, none definitely ulcerated. Large intestine normal. Two of the mesenteric glands showed small caseous patches. Spleen, liver and portal glands normal. Each kidney contained fairly numerous small grey nodules with small caseating centres; in the right was also a pea-sized caseous nodule. There were a few minute tubercles on the omentum. In the lungs was a moderate number of grey nodules with little central caseation; in the left lung also was a firm caseous gritty mass ½-in. in diameter. The left bronchial gland was beset with caseous areas.

THE VIRULENCE OF TUBERCLE BACILLI OF HUMAN ORIGIN FOR THE GUINEA-PIG.

THE VIRULENCE OF TUBERCLE BACILLI OF HUMAN ORIGIN FOR THE GUINEA-PIG.

The guinea-pig is very susceptible to infection by both our groups of tubercle bacilli of human origin. It proved rather more susceptible to viruses of Group I. than to those of Group II.

Intraperitoneal Injections.

Four guinea-pigs were injected intraperitoneally with each of 18 viruses, one pair receiving a dose of 1 mg. of culture, and another pair 0·1 mg. The viruses of Group I. proved slightly more virulent than those of Group II. Thus, taking the duration of life after injection and excluding all animals in which there was any complication, the average works out as follows :—

Dose in milligrammes.	Average duration of Life.	
	Group I.	Group II.
1·0 mg.	13·7 days (18 animals)	19·9 days (18 animals).
0·1 mg.	18·9 days (20 animals)	23·3 days (16 animals).

Feeding Experiments on 34 Guinea-Pigs.

Six guinea-pigs, Nos. 1058 to 1063, were fed almost daily until the end of the experiment with any severely affected tuberculous organs from the guinea-pigs which came to the post-mortem room from time to time, as well as with the tuberculous milk of Cow 295, the treatment being continued until the end of the experiment. Of these, three died within 11 days and showed no visible tuberculous lesions. The remaining three lived between six and seven weeks, and were found to have more or less tuberculous disease. The large solid organs were very slightly affected.

These experiments demonstrated the fact that guinea-pigs might be infected with tuberculosis by feeding, but showed that they were less susceptible to this method of infection than one might have supposed.

The remaining 16 guinea-pigs were fed with milk of Cow 295, H 10. "B.S." This cow, inoculated with a small dose of virulent bacilli, developed only a slight tuberculous infection of the udder, and the milk from the inoculated quarters was not very rich in tubercle bacilli, though it failed to infect by injection 1 guinea-pig only out of 20. It is probable that the milk became slightly richer in tubercle bacilli as time went on.

Of these one guinea-pig, "A," was fed daily for 127 days, commencing 25th November, 1903. Two others, 953 and 954, were fed daily for 50 and 60 days respectively, from 15th December, 1903. One, No. 1021, was fed for 57 days commencing 3rd February, 1904. None of these animals became infected with tuberculosis.

This unexpected result suggested that repeatedly feeding with small quantities of tubercle bacilli, each too small to seriously infect, might have an immunising effect, and that larger quantities, given for a short space of time only, might prove more capable of infecting.

Accordingly, a new set of feeding experiments on 12 guinea-pigs was begun on 9th April. Six of these received a small initial dose, and on and after 13th April 100 c.c. of milk between them daily, the feeding being continued for 32 days. The other six received larger quantities (150–200 c.c.) on four successive days only.

In each group 4 guinea-pigs entirely escaped tuberculous infection. The other 4 developed some tuberculosis, one only being seriously infected. There was but little difference between the two groups, the only one seriously affected belonging, however, to the larger dose group.

Twelve guinea-pigs were fed with a single dose of culture, two viruses being used; six received doses of 1· mg. and six 0·1 mg. In no case did death result within the period of observation, which varied from 51 to 91 days. All when killed were found to be affected with tuberculosis more or less widely distributed; six were found to have general tuberculosis, in one case not severe, four to have slight general tuberculosis, and in two others the disease was less advanced. In no case was it very severe. The dose did not appear to exert much influence.

These experiments show that the guinea-pig is less easily affected by feeding than by subcutaneous injection, and that after feeding repeatedly with milk containing small numbers of bacilli, they may even escape infection altogether.

It would appear that when given with the food bacilli contained in an emulsion of tuberculous tissue are, contrary to what occurs when they are injected, not more capable of infecting than when given in the form of culture.

CULTURE INJECTIONS INTO GUINEA-PIGS.

CULTURE INJECTIONS INTO GUINEA-PIGS.

Class I.—Viruses Virulent for Bovines.

All Intraperitoneal.

Virus.	Probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Guinea-pig.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.
H 2 Sp. "A" - [Virulent Strain.]	Lung	Calf 93, through G.P. 534.	2 years, 3 months.	1·0 mg.	**695**	350	Died	19 days	General tuberculosis.
		,, ,,	,,	,,	**696**	270	,,	15 ,,	
		,, ,,	,,	0·1 mg.	**697**	350	,,	27 ,,	
		,, ,,	,,	,,	**698**	340	,,	22 ,,	
H 28. "C.L." -	Cervical glands.	Human cervical glands direct.	13 months	1·0 mg.	**562**	400	,,	13 ,,	
		,, ,,	,,	,,	**563**	470	,,	16 ,,	General tuberculosis.
		,, ,,	,,	0·1 mg.	**560**	410	,,	24 ,,	
		,, ,,	,,	,,	**561**	440	,,	31 ,,	
		Human cervical glands through Rabbit 102.	14½ months	1·0 mg.	**687**	350	,,	27 ,,	General tuberculosis. Injection partly subcutaneous.
		,, ,,	,,	,,	**688**	320	,,	13 ,,	
		,, ,,	,,	0.1 mg.	**689**	330	,,	24 ,,	General tuberculosis.
		,, ,,	,,	,,	**690**	300	,,	17 ,,	
H 29. "M.F."	Cervical glands.	Human cervical glands, through G.P. 1,329.	11 months	1·0 mg.	**599**	320	,,	17 ,,	General tuberculosis.
		,, ,,	,,	,,	**600**	250	,,	12 ,,	Early general tuberculosis.
		,, ,,	,,	0·1 mg.	**601**	280	,,	16 ,,	General tuberculosis.
		,, ,,	,,	,,	**602**	250	,,	28 ,,	
H 38 "J.M."	Cervical and mesenteric glands.	Human cervical glands, through G.P. 793.	19½ months.	1·0 mg.	**580**	440	,,	14 ,,	General tuberculosis.
		,, ,,	,,	,,	**581**	520	,,	16 ,,	General tuberculosis. Death probably accelerated by other causes.
		,, ,,	,,	0·1 mg.	**582**	470	,,	21 ,,	General tuberculosis.
		,, ,,	,,	,,	**583**	500	,,	21 ,,	
H 14. "F.S." -	Mesenteric glands.	Human mesenteric glands, through G.P. 587.	2 years, 3 months.	1·0 mg.	**723**	370	,,	11 ,,	
		,, ,,	,,	,,	**725**	450	,,	10 ,,	General tuberculosis.
		,, ,,	,,	0·1 mg.	**724**	450	,,	12 ,,	
		,, ,,	,,	,,	**726**	500	,,	12 ,,	
H 19. "S.W."	Mesenteric glands.	Goat 11, direct -	1 year, 6 months.	1·0 mg.	**715**	500	,,	14 ,,	General tuberculosis.
		,, ,,	,,	,,	**716**	450	,,	20 ,,	Early tuberculosis. Death due to intestinal obstruction.
		,, ,,	,,	0·1 mg.	**717**	320	,,	33 ,,	General tuberculosis. Injection partly intramuscular.
		,, ,,	,,	,,	**718**	300	,,	17 ,,	General tuberculosis.

CULTURE INJECTIONS INTO GUINEA-PIGS.

Class II.—Viruses Slightly Virulent for Bovines.

All Intraperitoneal.

Virus.	Probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Guinea-pig.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.
H 25. "A.T."	Lung	Calf 417, direct	10½ months	1·0 mg.	570	370	Died	20 days	General tuberculosis.
		,, ,,	,,	,,	571	370	,,	24 ,,	
		,, ,,	,,	0·1 mg.	568	440	,,	32 ,,	
		,, ,,	,,	,,	569	360	,,	31 ,,	
		,, ,,	15 months	1·0 mg.	747	380	,,	20 ,,	
		,, ,,	,,	,,	748	330	,,	28 ,,	
		,, ,,	,,	0·1 mg.	757	320	,,	31 ,,	
		,, ,,	,,	,,	758	310	,,	29 ,,	
H 50. "P.H."	Lung	Human lung, through G.-P. 1490	3 months	1·0 mg.	572	520	,,	21 ,,	General tuberculosis.
		,, ,,	,,	,,	573	320	,,	23 ,,	
		,, ,,	,,	0·1 mg.	574	420	,,	23 ,,	
		,, ,,	,,	,,	575	380	,,	27 ,,	
H 51. "H.M."	Lung	Human lung, direct.	4 months	1·0 mg.	734	300	,,	14 ,,	General tuberculosis.
		,, ,,	,,	,,	735	340	,,	15 ,,	
		,, ,,	,,	0·1 mg.	736	300	,,	14 ,,	Early tuberculosis. Death probably due to other causes.
		,, ,,	,,	,,	737	270	,,	15 ,,	General tuberculosis.
H 52. "T.F."	Lung	Human lung, through G.-P. 1565	2 months	1·0 mg.	719	470	,,	12 ,,	General tuberculosis.
		,, ,,	,,	,,	720	450	,,	14 ,,	
		,, ,,	,,	0·1 mg.	721	350	,,	14 ,,	
		,, ,,	,,	,,	722	220	,,	23 ,,	
H 56. "F.T."	Lung	Human lung, through G.-P. 1682	3 months	1·0 mg.	789	300	,,	21 ,,	General tuberculosis.
		,, ,,	,,	,,	790	300	,,	16 ,,	
		,, ,,	,,	0·1 mg.	791	370	,,	21 ,,	
		,, ,,	,,	,,	792	340	,,	22 ,,	
H 54. "C.W."	Bronchial glands (?)	Human spleen, through G.-P. 1609	2 months	1·0 mg.	738	310	,,	15 ,,	General tuberculosis.
		,, ,,	,,	,,	739	340	,,	15 ,,	
		,, ,,	,,	0·1 mg.	740	250	,,	15 ,,	
		,, ,,	,,	,,	741	320	,,	14 ,,	
H 55. "R.D."	Cervical and mesenteric glands.	Human mesenteric glands, direct.	3 months	1·0 mg.	780	300	,,	17 ,,	General tuberculosis.
		,, ,,	,,	,,	781	320	,,	16 ,,	
		,, ,,	,,	0·1 mg.	782	450	,,	29 ,,	
		,, ,,	,,	,,	783	300	,,	20 ,,	

CULTURE INJECTIONS INTO GUINEA-PIGS.

Class I.—Viruses Virulent for Bovines.

All Intraperitoneal.

Virus.	Probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Guinea-pig.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.
H 20. "F.L."	Mesenteric glands.	Calf 213, direct -	1 year, 5 months.	1·0 mg.	**699**	370	Died	13 days	General tuberculosis.
		,, ,,	,,	,,	**700**	320	,,	14 ,,	
		,, ,,	,,	0·1 mg.	**701**	300	,,	15 ,,	
		,, ,,	,,	,,	**702**	350	,,	18 ,,	
H 32. "Y.W."	Mesenteric glands.	Human bronchial gland, through Rabbit 166.	6 months	1·0 mg.	**590**	250	,,	18 ,,	General tuberculosis. Injection partly intracæcal.
		,, ,,	,,	,,	**591**	230	,,	16 ,,	General tuberculosis.
		,, ,,	,,	0·1 mg.	**592**	280	,,	16 ,,	General tuberculosis and septic peritonitis.
		,, ,,	,,	,,	**593**	230	,,	15 ,,	General tuberculosis.

CULTURE INJECTIONS INTO GUINEA-PIGS.

Class II.—Viruses Slightly Virulent for Bovines.

All Intraperitoneal.

Virus.	Probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Guinea-pig.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.
H 26. "K.M."	Kidney	Human kidney, through G.-P. 1326	11 months	1·0 mg.	**615**	300	Died	22 days	General tuberculosis.
		" "	"	"	**616**	240	"	27 "	
		" "	"	0·1 mg.	**617**	240	"	27 "	
		" "	"	"	**618**	250	"	24 "	General tuberculosis. Injection ? partly intracæcal.

CULTURE INJECTIONS INTO GUINEA-PIGS—*continued.*

CLASS III.—Virus not susceptible of being placed either in Class I. or Class II.

Origin of Virus: Human Tuberculosis, believed to be primary in skin (Lupus).

Intraperitoneal Injections.

Virus.	Probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Guinea-Pig.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.
H 53. "D.H."	Skin [Lupus]	Diseased tissue, through G.P. 1482.	8½ months	1· mg.	**730**	450	Died	13 days	Acute General Tuberculosis.
		,, ,,	,,	1·	**731**	380	,,	14 ,,	General Tuberculosis.
		,, ,,	,,	0·1	**732**	350	,,	34 ,,	,,
		,, ,,	,,	0·1	**733**	280	,,	16 ,,	

FEEDING EXPERIMENTS ON GUINEA-PIGS.

I. WITH TUBERCULOUS MILK OR TUBERCULOUS TISSUES.

CLASS I.—Viruses Virulent for Bovines.*

All these Guinea-pigs received tubercle bacilli virulent for bovines.

Virus.	Immediate source of material used for experiment.	Date of Feeding: Quantity received: Duration of experiment.	No. of Guinea-pig.	Killed or Died.	Duration of Life in days.	Results.
H 10. "**B.S.**" [Virulent] and numerous other viruses.	Milk of Cow 295 and tissues of tuberculous Guinea-pigs.	Feeding commenced 18th February, 1904, and continued almost daily during the whole period of each experiment.	1,058	D.	46 days	Tuberculosis of gut, cervical, mesenteric and other lymphatic glands, and spleen.
			1,059	K.	46 „	Tuberculosis of gut, mesenteric and cervical glands.
			1,060	D.	11 „	No tuberculosis.
			1,061	K.	9 „	No tuberculosis. Pseudo-tuberculosis.
			1,062	K.	47 „	Tuberculosis of gut, mesenteric glands and spleen.
			1,063	D.	11 „	No tuberculosis.
H 10. "**B.S.**"	Milk of Cow 295	Fed daily from 25th November, 1903, during the whole period of the experiment.	"A."	K.	127 „	Healthy.
„ „	„ „	Fed daily from 15th December, 1903, during the whole period of the experiment.	953	D.	50 „	No tuberculosis.
			954	K.	60 „	No tuberculosis.
„ „	„ „	Fed daily from 3rd February, 1904, during the whole period of the experiment.	1,021	K.	57 „	Healthy.
„ „	„ „	Fed for a limited time, with large quantities of tuberculous milk, on the 9th, 10th, 11th and 12th of April only, receiving, together, about 700cc. of milk.	1,161	K.	86 „	No tuberculosis.
			1,162	K.	86 „	Normal throughout.
			1,163	K.	86 „	Normal throughout.
			1,164	D.	24 „	No tuberculosis.
			1,165	K.	86 „	General tuberculosis — lungs, liver, spleen, and kidneys contained tubercles.
			1,166	K.	86 „	Four minute foci in mesenteric glands.
„ „	„ „	Fed daily for thirty-two days. A small initial dose on 9th April, 1904, and daily on and after 13th April, 1904.	1,167	K.	86 „	Normal throughout.
			1,168	K.	86 „	Normal throughout.
			1,169	D.	9 „	No tuberculosis.
			1,170	K.	86 „	No tuberculosis.
			1,171	K.	86 „	Mesenteric, ileo-colic, hepatic glands and spleen affected, also mucous surface of colon.
			1,172	K.	86 „	Tuberculosis of abdominal and bronchial glands. One focus in spleen.

* Guinea-pigs 1058 to 1063 received a large quantity of tuberculous tissues from various guinea-pigs, and therefore received bacilli belonging to Group II. as well as those belonging to Group I.

Note.—Full post-mortem notes of the infected guinea-pigs are given on page 528.

FEEDING EXPERIMENTS ON GUINEA-PIGS—*continued.*

II. WITH CULTURES.

CLASS I.—Viruses virulent for Bovines.

I. Virus H 59. "L.B."

Culture derived from human brain, through Guinea-pig 1860.

Dose in milligrammes.	Number of Guinea-pig.	Weight in grammes.	Killed or Died.	Duration of life in days.	Result.
1·	**1947**	230	Killed	51 days	Slight general tuberculosis. Pharynx normal. One submental gland and one cervical gland caseous; others normal. Five small ulcers in ileum. Mesenteric glands caseating. Three nodules with caseous centres in spleen, few opaque nodules in liver. In the left lung were four nodules with caseous centres; in the right were a few small grey tubercles. Bronchial glands extensively caseous.
1·	**1948**	270	,,	61 ,,	Slight general tuberculosis. Pharynx normal. The glands of the neck and throat were largely caseous and softened. One Peyer's patch in the ileum was enlarged, thickened and caseating. Two mesenteric glands showed caseous patches becoming confluent. Ileo-colic and ileo-cæcal glands similar, but not so advanced. Two small grey tubercles in spleen, one in liver, four in lungs. Bronchial glands indurated, with softened caseous patches.
1·	**1949**	270	,,	91 ,,	There was a tuberculous ulcer on each lip. The mucous membrane of the gum in front of the lower incisors showed a large ulcerated area, the floor of which was covered with caseo-pus. Pharynx normal. The submaxillary glands were fibro-caseous. An enlarged cervical and one submental gland contained cavities filled with caseo-pus. In the small intestine were six tuberculous ulcers, and there was one in the cæcum. The enlarged mesenteric glands showed large cavities filled with muco-pus, surrounded by dense fibroid tissue. The spleen and liver contained a few grey nodules with caseous centres, and some small grey foci. In the lungs were some large caseous nodules beginning to soften. Bronchial and portal glands tuberculous.
0·1	**1950**	300	,,	51 ,,	General tuberculosis. Pharynx normal. Several neck and throat glands contained each a caseous focus; others were normal. A Peyer's patch in the ileum contained a caseous area 2 mm. in diameter commencing to ulcerate. Three small foci were found elsewhere in the intestine. Three mesenteric glands each contained a firm caseous nodule. A minute caseous focus was seen in one ileo-colic gland. Spleen was closely beset with yellow caseous nodules; liver closely packed with irregular yellow necrotic areas. Lungs contained three caseous tubercles, and numerous minute early tubercles. Bronchial glands extensively caseated. Most of the remaining lymphatic glands contained tubercles.
0·1	**1951**	270	,,	61 ,,	Slight general tuberculosis. Pharynx normal Submental and right submaxillary glands extensively caseous and softened. In the ileum were three tuberculous ulcers, the largest 5 mm. in diameter. The terminal mesenteric gland was enlarged, indurated, and caseous throughout half its substance. Two other mesenteric, the ileo-colic, and the ileo-cæcal glands were partly caseous. One grey tubercle found in spleen, one in liver, and two in left lung. Bronchial glands normal.
0·1	**1952**	280	,,	91 ,,	General tuberculosis. Pharynx normal. Glands of the neck enlarged, dense, and showed varying amounts of caseation. To one of them the skin was adherent, and showed a small ulcer. In the ileum were six hard caseous nodules, each with a minute ulcer on the mucous surface; intestines otherwise normal. The enlarged terminal mesenteric gland was largely caseous. Other mesenteric and the ileo-colic glands were normal. Liver, spleen, and lungs contained a few small tubercles. Bronchial glands large, partly fibroid, partly caseous.

FEEDING EXPERIMENTS ON GUINEA-PIGS—*continued.*

II.—WITH CULTURES.

Class I. Viruses Virulent for Bovines.

II. Virus H 64. "M.G."

Culture derived from human mesenteric glands, through Guinea-pig 1880.

Dose in milligrammes.	Number of Guinea-pig.	Weight in grammes.	Killed or Died.	Duration of life in days.	Result.
1·	**1953**	320	Killed	51 days	General tuberculosis, not severe. Pharynx and glands of the neck and throat normal. In the anterior part of the small intestine was a single grey tubercle, not ulcerated. In the lower part of the ileum was a ring of thickened grey tissue containing a few caseous foci; in the mucous membrane over it were some small irregular ulcers. The terminal mesenteric gland was the size of a broad bean and caseous; three other pea-sized mesenteric glands were similar. Two ileo-colic glands were partly caseous; a colic gland contained a caseous tubercle. Spleen contained a dozen grey nodules with caseous centres. Liver showed three or four grey nodules, without sign of caseation. In each lung there was one caseous nodule; minute grey points were also seen, early tubercles (?). Bronchial glands enlarged and caseating. Portal gland and one lumbar gland similar.
1·	**1954**	270	„	61 „	General tuberculosis. Pharynx normal. The right submental glands were partly caseous, those on the left caseous and softened throughout. The submaxillary and mid-cervical glands contained cavities filled with caseo-pus. Intestines, mesenteric glands, ileo-colic and colic glands normal. Spleen contained fairly numerous nodules up to the size of a pea, with caseous centres. There were a few similar nodules in the liver. The lungs were crepitant; in them were many grey tubercles with minute yellow centres and some larger nodules almost completely caseous. Bronchial glands dense and fibroid, containing yellow foci or cavities filled with caseo-pus. Portal glands somewhat similar.
1·	**1955**	270	„	91 „	General tuberculosis. Pharynx and glands in neck normal. The small intine contained about ten typical ulcers, mostly large and completely encircling the gut. The mesenteric and ileo-colic glands were much enlarged, dense, and fibroid, with caseating foci or large cavities filled with muco-purulent material. Large intestine normal. The spleen contained three grey nodules with caseous centres. In the liver was a large fibrous mass containing two caseous nodules, and two or three grey tubercles. The lungs were crepitant and showed half a dozen grey nodules with caseous centres. The bronchial, portal, and lumbar glands were somewhat similar to the mesenteric.
0·1	**1956**	270	„	51 „	Slight general tuberculosis Pharynx and glands of the neck and throat normal. In the ileum was a thickened area extending transversely almost round the gut; in it were caseous foci, the mucous membrane over it showing a large ulcer, 5 mm. in diameter, containing caseo-pus. The terminal mesenteric gland, the size of a broad bean, was largely caseous. Other mesenteric glands were normal. There were three softened caseous nodules in spleen, and three or four small grey tubercles in liver. Lungs and bronchial glands normal.
0·1	**1957**	320	„	61 „	Pharynx and glands of neck and throat normal. Small intestine normal. In the colon was a congested ulcer, with its floor covered with caseo pus. In the surrounding tissue were minute caseous foci. Cæcum normal. In the terminal mesenteric gland were a few caseous foci. The ileo-cæcal gland was caseous throughout. The ileo-colic glands contained small cavities filled with caseo-pus. The colic glands were normal. Two grey tubercles with minute yellow centres in spleen; one minute grey focus in liver. Lungs and bronchial glands normal. One portal gland contained early caseating foci.
0·1	**1958**	260	„	91 „	General tuberculosis. Pharynx normal. The glands of the neck and throat were much enlarged and caseous throughout. Intestines normal. Three of the mesenteric glands were caseous throughout; the others, and the ileo-colic glands, were normal. In the spleen were about ten caseous nodules. In the liver were a number of caseo-necrotic patches. The lungs contained a moderate number of caseous nodules with grey margins. The bronchial, portal, cœliac, and lumbar glands were caseous.

POST-MORTEMS ON GUINEA-PIGS FED WITH TUBERCULOUS MILK OR TUBERCULOUS TISSUES.

No. 1058. Small ulcer in ileum. Several tuberculous deposits in caecum. Cervical, mesenteric, ileo-colic, and hepatic glands were enlarged and caseous. The bronchial and anterior sternal glands contained caseous foci. The lumbar glands also contained caseous foci, and the inguinals were slightly enlarged and caseous. The lungs were normal. The liver showed a few ochre-coloured specks of degeneration. The spleen was very slightly enlarged, but was nodular and contained groups of tubercles.

No. 1059. There were tuberculous foci in the Peyers patches, commencing quite high up, but becoming much more pronounced near the ileo-caecal valve, and there was one similar focus in the colon. The mesenteric and colic glands were enlarged and caseous. One deep cervical gland was enlarged and dense, but not caseous; the other was similarly affected. The large solid organs were normal.

No. 1062. Two small caseous foci were found under the mucous membrane of the ileum. The mesenteric glands were very large, caseous, and partly softened. The cervical glands were somewhat enlarged, but not caseating. The liver showed some pale degenerated specks. The spleen was normal in size, but contained a single raised yellowish tubercle.

No. 1164. In the mesenteric gland, which was otherwise normal, were three pinpoint opaque whitish foci, and there was a similar one in the ileo-colic gland. Numerous tubercle bacilli were found in both.

No. 1165. The mesenteric glands were slightly enlarged, very hard and fibrous. The hepatic gland was larger, as big as a haricot bean, also tough and fibrous and speckled with minute yellow points. The bronchial glands were enormous, forming a single mass $\frac{1}{2}$ by $\frac{7}{8}$ by $\frac{1}{2}$ inch, very tough and fibrous, almost cartilaginous, speckled with minute yellow foci, and containing small cysts full of pus. The post-manubrial gland was also very much enlarged, and similar in structure. The other post-sternal glands were scarcely affected. Three cervical glands, each as large as a bean, and a right inguinal of equal size were similarly affected. The spleen was moderately enlarged, and its surface was rendered nodular by groups of whitish tubercles which projected and just showed through the surface. The liver and lungs contained a moderate number of small grey tubercles and some pale spots of degeneration. Numerous tubercle bacilli were found in the purulent fluid from the bronchial gland, and from the caseous matter of the inguinal gland.

No. 1170. There was a small caseous and softened focus, less than a small pin's head in size, in an otherwise normal mesenteric gland. The rest of the body was normal. No tubercle bacilli were found in the caseous point.

No. 1171. There were three little whitish spots in the colon—cellular deposits under the mucous membrane—and in these tubercle bacilli were found. The colic, mesenteric, and hepatic glands were enlarged, very hard and fibrous and partly caseous. The caseous matter in the colic glands was beginning to soften. Two minute translucent tubercles were found in the spleen, and in the liver there were patches composed of light-coloured spots. The lungs, bronchial glands, and all other parts were normal. Tubercle bacilli were found in the colon, colic glands, and spleen, but not in the liver.

No. 1172. The mesenteric and colic glands were enlarged, very hard and fibrous, with caseous foci. The bronchial glands were very much enlarged and similar in structure. There was a yellow focus in the spleen as large as a mustard seed. All other parts were normal. Tubercle bacilli were found in spleen and bronchial glands.

THE VIRULENCE OF TUBERCLE BACILLI OF HUMAN ORIGIN FOR THE GOAT.

THE VIRULENCE TUBERCLE BACILLI OF HUMAN ORIGIN FOR THE GOAT.

Only a limited number of experiments were made with the goat, but they are sufficient to show that this animal reacts to the two kinds of tubercle bacilli just as the calf does; in other words it is capable of resisting serious infection with tubercle bacilli of Group II. while it succumbs to bacilli of Group I. unless the dose be small, and in that case it develops a limited and non-progressive tuberculosis.

Five goats were subcutaneously injected with tissue emulsions containing tubercle bacilli belonging to Group I. All died, or were killed when very ill, and were found to be suffering from general tuberculosis.

One alone received a culture belonging to Group I. The dose was very small, and the number of bacilli injected, estimated by counting, was only 1,800,000. The animal remained well. It was killed after 198 days, and was found to have a small number of retrogressing tubercles in the lungs and elsewhere.

Two goats were fed with culture belonging to a virus of Group I. They both died of tuberculosis, with severe and extensive ulceration of the intestine. The doses were not particularly large (10 and 1 mg.) and this species of animal would therefore appear to be rather susceptible to infection by feeding.

With viruses of Group II. four very young kids and three goats were injected; tissue emulsions being used in each case. Two of the goats were used for testing whether any immunity is conferred by an injection of bacilli of Group II. They are only introduced here to demonstrate the comparative harmlessness of bacilli of Group II. for this species. One of the kids was injected intravenously; the other animals were injected subcutaneously; in no case did fatal or progressive tuberculosis result, and such little tubercles as were found in the glands and organs were translucent and obviously retrogressing.

GOATS INJECTED WITH "TISSUE EMULSIONS" AND CULTURES.

CLASS I.—Viruses Virulent for Bovines.

(*a*) *Tissue Emulsions.*

Virus used.	Probable primary seat of disease.	Immediate source of tissue emulsion injected.	Mode of Infection.	Estimated dose of T.B.	No. of Goat.	Weight in kilos.	Result. Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
H 28. "C.L."	Cervical glands.	Calf 515. (Prepectoral and cervical glands.)	Subcut.	5,000,000	23	39·46	Died after 96 days	General tuberculosis severe.
H 10. "B.S."	Mesenteric glands.	Calf 113. (Prescapular gland.)	Subcut.	1,805,000	3		Killed when very ill. „ 47 „	General tuberculosis moderate.
H 14. "F.S."	Mesenteric glands.	Heifer 197. (Prescapular gland.)	Subcut.	4,517,000	5	23·12	Died „ 75 „	General tuberculosis moderate.
H 19. "S.W."	Mesenteric glands.	Calf 271. (Prescapular gland.)	Subcut.	53,440,000	11	53·06	Dying „ 77 „	General tuberculosis moderate.
H 32. "Y.W."	Mesenteric glands.	Calf 487. (Prescapular gland.)	Subcut.	155,150,000	7	48·95	Killed when very ill. „ 27 „	General tuberculosis severe.

(*b*) *Cultures.*

Virus used.	Probable primary seat of disease.	Immediate source of culture.	Mode of Infection.	Dose of culture.	No. of Goat.	Weight in kilos.	Result. Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
H 10. "B.S."	Mesenteric glands.	Calf 113, through G.P. 757.	Subcut.	Small dose, estimated to contain 1,800,000 T.B.	17		Killed when well. after 198 days	General Tuberculosis slight.

GOATS INJECTED WITH "TISSUE EMULSIONS" AND CULTURES.

CLASS II.—Viruses slightly Virulent for Bovines.

(a) Tissue Emulsions.

Virus used.	Probable primary seat of disease.	Immediate source of tissue emulsion injected.	Mode of Infection.	Estimated dose of T.B.	No. of Goat.	Weight in kilos.	Result. Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
H 17. Sp. "B."	Lung	Calf 391. (Prescapular gland and local lesion).	Subcut.	102,340,000	**37** (Kid).	15·86	Killed when well. after 231 days	S.T. — Minimal local lesion. Calcareous nodules in nearest gland. Few fibrous translucent tubercles, containing minute yellow foci, in lung.
,,	,,	,, ,,	,,	,,	**39** (Kid).	11·79	Killed when well. ,, 92 ,,	S.T. — Minimal local lesion. Calcareous nodules in nearest glands. A moderate number of small translucent tubercles in lungs, very few of which showed central opacity. Few caseous foci in the mesenteric glands.
	,,	Kid 39. (Prescapular gland).	Subcut.	4,269,000	**43** (Kid).	10·88	Killed when well. ,, 137 ,,	S.T. — Minimal local lesion. Three caseous foci in nearest gland. One small fibrous tubercle in each lung.
,,	,,	,, ,,	Intravenous.	1,067,000	**45** (Kid).	11·34	Killed when well. ,, 137 ,,	S.T.—A number of small translucent tubercles in lungs, one only containing a small caseous centre. Few caseating foci in bronchial glands. A small group of tubercles in liver.
H 8. "S.C."	Mesenteric glands.	Calf 361. (Thoracic glands).	Subcut.	3,073,000	**25**	21·77	Killed when well. after 2⅓ years	S.T.—Some pea-sized calcareous nodules between site of injection and nearest lymphatic gland. One similar nodule in gland. Few fibrous tubercles in lung.

(b) Cultures.

Virus used.	Probable primary seat of disease.	Immediate source of culture.	Mode of Infection.	Dose in milligrammes.	No. of Goat.	Weight in kilos.	Result. Fate and condition of animal at death.	Amount and range of tuberculous lesions at death.
				NONE.				

GOATS INJECTED WITH "TISSUE EMULSIONS."

[Goats use for "Immunity" Experiments.]

Virus used.	Immediate source of tissue emulsion injected	Mode of infection.	Estimated dose of tubercle bacilli.	No. of Goat.	Weight in kilos.	Number of separate injections received.	Interval in days between successive injections.	Result.
Experiment with Goat I.								
Virus slightly virulent for bovines. — **H 17. Sp. B.** [Lungs]	Calf 161, mesenteric glands	Subcut.	33,000	1	25·40	First		Animal remained well; slight local lesion only.
Virus slightly virulent for bovines. — **H 17. Sp. B.**	Calf 339, through G.P. 1235	Subcut.	31,272,000	1	34·92	Second	353 days after primary inoculation	Animal remained well; small local lesion and slight enlargement of gland only.
Viruses virulent for bovines. — **H 28. "C.L."** [Cervical glands]	Calf 515, prepectoral and cervical gland	Subcut.	10,000,000	1	39·91	Third	35 days after 2nd inoculation	Animal remained well; small local lesion and slight enlargement of gland only. [*See* Control Goat 23, page 629.]
Viruses virulent for bovines. — **H 32. "Y.W."** [Mesenteric glands]	Calf 487, prescapular gland	Subcut.	620,000,000	1	40·82	Fourth	72 days after 3rd inoculation	Died after 34 days. Acute miliary tuberculosis of lungs. No tuberculosis elsewhere.
Experiment with Goat 19.								
Virus slightly virulent for bovines. — **H 8. "S.C."** [Mesenteric glands]	Calf 305, thoracic glands	Subcut.	12,550,000	19	28·57	First	—	Animal remained well; small local lesion and slight enlargement of glands only.
Virus slightly virulent for bovines. — **H 8 "S.C."**	Calf 361, thoracic glands	Subcut.	3,073,000	19	23·57	Second	135 days after primary inoculation	Animal remained well; small local lesion and slight enlargement of glands only.
Virus virulent for bovines — **H 32. "Y.W."** [Mesenteric glands]	Calf 487, prescapular gland	Subcut.	310,000,000	19	28·57	Third	146 days after 2nd inoculation	Died after 35 days. Acute miliary tuberculosis of lungs.

FEEDING EXPERIMENTS ON TWO GOATS.

CULTURES.

CLASS I.—Virus Virulent for Bovines.

Virus.	Probable primary seat of disease.	Immediate source of culture used.	Dose in milligrammes.	Number of Goat.	Weight in kilos.	Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
H 31. "L.F."	Cervical glands.	Human cervical glands, direct	10 mg.	**35**	31·75	Dying after 106 days	General Tuberculosis moderate.
		„ „	1 mg.	**33**	28·57	Died after 199 days	General Tuberculosis moderate.

THE VIRULENCE OF TUBERCLE BACILLI OF HUMAN ORIGIN FOR THE PIG.

THE VIRULENCE OF TUBERCLE BACILLI OF HUMAN ORIGIN FOR THE PIG.

The pig proved to be one of those animals which, like the ox, goat, rabbit and cat, is very susceptible to infection with tubercle bacilli of Group I., while it can easily resist bacilli of Group II. Whether it were injected subcutaneously or fed with bacilli of the former kind, severe general tuberculosis resulted, while similar treatment with bacilli of the latter kind provoked only minimal and retrogressive lesions.

Infection by bacilli of Group I., injected subcutaneously in doses of 50 and 10 mgs., proved fatal about as rapidly as it did in the calf (but one pig only was injected with each dose), but smaller doses, 1·0 and 0·1, also produced general tuberculosis of a severe and progressive type. The pig would therefore seem to be less capable of resisting small doses of bacilli of Group I., when subcutaneously injected than the ox.

By feeding also the pig is easily infected with bacilli of Group I., and single doses (10, 1·0 or 0·1 mg.) of culture thus administered, have produced general tuberculosis. After 10 mgs. the disease was severe, but with the smaller of these doses the lesions at the end of three months were only slight or moderate. Still smaller doses introduced with the food were successfully resisted, and pigs fed for four months on milk containing bacilli, small, indeed, in number, but sufficient to cause tuberculosis when intraperitoneally injected into guinea-pigs, were at the end of that time found to have minimal lesions only.

The bacilli of Group II. proved as incapable of causing a progressive tuberculosis in the pig as in the ox or goat. By subcutaneous injection, 50 mg. produced only trivial local lesions, some tuberculosis of the neighbouring lymph glands, a number of little retrogressive tubercles in the lungs, and perhaps a few elsewhere. These little retrogressive tubercles in the lungs were either entirely translucent, or contained minute caseous centres; they were very like those often seen in calves injected with viruses of Group II., but they seemed to be more numerous in the pig than was commonly the case in the calf, and to be more constantly present.

Feeding with bacilli of Group II. also caused only minimal lesions. Single doses of culture (four 50 mg., one 1 mg.) caused no more than caseous lesions in some of the lymph glands of the alimentary canal, and a few little retrogressive tubercles in the lungs. In one instance of feeding with 50 mg. there were no lesions in the alimentary canal, or the glands connected therewith, and the only lesion found was a single little tubercle in the lungs. In another pig, also fed with 50 mg. of the same culture, there were no lesions in the alimentary canal or its glands, but there was a little shot-sized fibrous nodule in the lungs, which was probably a tubercle, though no tubercle bacilli could be found in it.

Feeding for five months with large quantities of human sputum (Sp. A) containing numerous tubercle bacilli caused only minimal calcareous lesions in some of the glands connected with the alimentary canal.

CULTURE INJECTIONS INTO PIGS.

Class I.—Virus Virulent for Bovines.

Subcutaneous Injections.

Virus.	Probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of animal.	Weight in kilos.	Result. Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
H 59. "L.B."	Mesenteric glands	Human brain, through G.P. 1860	5½ months	50 mg.	**65**	10·88	Dying after 30 days.	Early general tuberculosis.
				10· ,,	**59**	10·88	Died after 70 days.	Severe and wide spread general tuberculosis.
				1· ,,	**67**	11·78	Killed when apparently well after 84 days.	Severe and wide spread general tuberculosis.
				0·1 ,,	**73**	13·15	Killed when well after 86 days.	General tuberculosis.

CULTURE INJECTIONS INTO PIGS.

Class II.—Viruses Slightly Virulent for Bovines.

Subcutaneous injectinos.

Virus.	Probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of animal.	Weight in kilos.	Result. Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
H 56. "F.T."	Lung	G.P. 1682, from human lung	6½ months	50 mg.	**23**	20·41	Killed when well after 65 days	Slight tuberculosis.
,,	,,	,, ,,	9 months	50 mg.	**43**	30·38	Killed when well after 91 days	Slight tuberculosis.
,,	,,	,, ,,	6½ months	1 mg.	**21**	23·57	Killed when well after 98 days	Slight tuberculosis.
H 50. "P.H."	Lung	G.P. 1490, from human lung	15 months	50 mg.	**45**	26·75	Killed when well after 92 days	Slight tuberculosis.
	,,	,, ,,	,,	50 mg.	**49**	26·30	Killed when well after 92 days	Slight tuberculosis.

FEEDING EXPERIMENTS ON PIGS.

Class I.—Viruses Virulent for Bovines.

[A] *Pigs fed with Milk of Tuberculous Cow.*

Virus.	Probable primary seat of disease in man.	Immediate source of milk used for experiment.	Date of feeding. Quantity received. Duration of experiment.	No. of Pig.	Age.	Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
H 10. "B.S."	Mesenteric glands.	Cow 295 (Intramamary inoculation.)	Fed almost daily from November 30th, 1903 to April 7th, 1904. [129 days.]	**13**	11 weeks	Killed when well after 129 days.	Slight tuberculosis.
			Fed almost daily from November 30th, 1903 to March 30th, 1904. [121 days.] (The cow did not become severely affected, and tubercle bacilli were not at any time numerous in the milk. Each pig is estimated to have received over 60 gallons.)	**15**	11 weeks	Killed when well after 121 days.	Local tuberculosis.

[B] *Pigs fed with Culture.*

Virus.	Probable primary seat of disease.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	No. of Pig.	Weight in kilos.	Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
H 59. "L.B."	Mesenteric glands.	Human brain through G.P. 1860	5½ months	10· mg.	**63**	9·98	Killed when well after 88 days.	General tuberculosis; mesenteric glands very severely affected.
				1· mg.	**71**	13·76	Killed when well after 89 days.	General tuberculosis, slight.
				0·1 mg.	**57**	9·98	Killed when well after 90 days.	General tuberculosis, moderate.

FEEDING EXPERIMENTS ON PIGS.

Class.—Viruses Slightly Virulent for Bovines.

[A] *Pigs fed with Milk of Tuberculous Cows.*

Virus.	Probable primary seat of disease in man.	Immediate source of milk used for experiment.	Date of feeding. Quantity received. Duration of experiment.	Number of Pig.	Age.	Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
			None.				

[B] *Pigs fed with Culture.*

Virus.	Probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Pig.	Weight in kilos.	Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
H 56. "F.T."	Lung.	G.P. 1,682, from human lung	6½ months	50 mg.	**25**	19·95	Killed when well after 98 days	Slight tuberculosis.
		,, ,,	9 ,,	50 ,,	**37**	28·57	Killed when well after 91 days.	,, ,,
		,, ,,	6½ ,,	1 ,,	**27**	23·12	Killed when well after 99 days.	,, ,,
I 50. "P.H."	Lung.	G.P. 1,490, from human lung.	15 months	50 mg.	**53**	20·86	Killed when well after 93 days.	Very slight tuberculosis.
		,, ,,	15 ,,	50 ,,	**55**	23·57	Killed when well after 92 days.	No tuberculosis.

PIGS FED WITH MIXED VIRUSES,

Namely with bacilli of Group II. and probably a small proportion of bacilli of Group I.

Virus.	Probable primary seat of disease in man.	Immediate source of material used for experiment.	Date of feeding : Quantity received : Duration of experiment.	No. of Pig.	Killed or died.	Duration of life in days.	Results.
H 2. "Sp. A."	Lungs	Human sputum	Fed almost daily from 2nd June, 1902, to 7th November, 1902 [159 days].	1 (9 weeks old)	Killed when well	159 days	Submaxillary and one mesenteric gland contained calcareous foci.
		,,	Fed almost daily from 2nd June, 1902, to 24th January, 1903 [236 days].	3 (9 weeks old)	,,	376 ,,	Submaxillary and two mesenteric glands showed calcareous foci. Group of small tubercles in lung.
Various viruses	—	Fed with milks from cows 33, 43, 49, 73, and 87 at various periods throughout experiment.	Fed almost daily from 6th July, 1902, to 23rd December, 1902 [170 days].*	5 (young pig)	,,	346 ,,	Three mesenteric glands contained minute calcareous foci.
			Fed almost daily from 9th July, 1902, to 23rd December, 1902 [167 days].	7 (young pig)	,,	348 ,,	Submaxillary and three mesenteric glands contained calcareous foci.

* Pig 5 also received a single feed of 10 c.c. of emulsion of the udder of Cow 3 on 3rd July, 1902.

THE VIRULENCE OF TUBERCLE BACILLI OF HUMAN ORIGIN FOR THE MONKEY, BABOON, AND CHIMPANZEE.

THE VIRULENCE OF TUBERCLE BACILLI OF HUMAN ORIGIN FOR THE MONKEY, BABOON AND CHIMPANZEE.

The monkeys used belonged to the common Macacus Rhesus of India. They were young individuals, usually just about to cut the first of their permanent teeth, but in three instances they were quite babies, namely about four to seven months old.

Of the two baboons one came from South and the other from East Africa.

Subcutaneous Injection of Tissue Emulsions.

Seven monkeys were subcutaneously injected with emulsions of tuberculous tissues, but unfortunately the number of bacilli in the doses was not estimated. They show that the monkey is susceptible to tuberculosis caused by either of our two groups of bacilli.

The most interesting are No. 13, injected with an emulsion of human mesenteric glands, belonging to the Virus H 7, C.M., which proved virulent to the ox and rabbit; and Nos. 5 and 17 injected also with emulsions of human mesenteric glands, but which proved very slightly virulent for the ox and rabbit. These belonged to the viruses known as H 6, U.H. and H 8, S.C. They all died of general tuberculosis; the one injected with bacilli of Group I. in 69 days, and those injected with bacilli of Group II. in 37 and 68 days respectively. As the exact dose is not known no direct comparison can be drawn.

Subcutaneous Injection of Cultures.

Six monkeys were injected subcutaneously with cultures of bacilli belonging to our Group II. No injections have yet been made with cultures belonging to our Group I. The only comparison possible therefore is with the monkeys injected with bovine tubercle bacilli at Walpole Farm.

Three of these injected with Virus H 61, E.C. died of general tuberculosis in from 73 to 77 days. The amount of the dose was not observed to influence the result. The strain of bacilli used had only been one month in artificial cultivation.

In the next case the strain had been growing in our incubators for three and a-half years, and may possibly have lost a little of its original virulence. It belonged to the Virus H 8, S.C. Whether for this or for some other reason, the animals injected with it, though they received similar doses to those already described, lived much longer. No. 69 became completely paralysed in its hind legs, and this was found to be due to a caseous growth along the theca spinalis of the lower dorsal and lumbar cord. In general health it seemed fairly well when it was killed 69 days after injection, but it was found to have general tuberculosis. The ulcer in the skin at the seat of injection had completely healed.

If it be admitted that the strain used for these last three monkeys was partly attenuated by long continued culture on artificial media, and rely on the first three monkeys to determine the virulence of bacilli of Group II. for this species when injected subcutaneously, we nevertheless find that the duration of the disease was longer than that of those injected with bovine cultures at Walpole. But the experiments are not numerous enough to admit of an exact comparison, and in any case the difference thus shown is a small one.

Feeding Experiments with Tuberculous Milk.

Three baby monkeys were fed with cow's milk containing tubercle bacilli. One received daily for 128 days about 30 cc. of milk, which always contained enough tubercle bacilli to kill guinea-pigs when these were injected with it, but which was never rich in bacilli. It came from Cow 295 injected in the milk sinuses of the udder with bacilli belonging to the Virus H 10, B.S., which belonged to our Group I. In spite of this long continued feeding with small doses of tubercle bacilli, the monkey was quite free from tuberculosis when killed; but was found to be suffering from severe rickets.

The other two were fed once only, each with 90 cc. of milk from Cow 143, H 28. C.L., estimated to contain 5,000,000 tubercle bacilli in the dose. They died 80 and 88 days afterwards, with extensive ulceration of the intestine, caseation of the mesenteric glands, and general tuberculosis.

Feeding Experiments with Culture.

Four monkeys were fed with culture of bacilli belonging to the Virus H 10, B.S., Group I, and three with viruses belonging to the Virus H 60, W.B., Group II. All died of general tuberculosis in two or three months, except No. 51 which received a very small dose (·01 mg.) of Group I. bacilli. This animal lived 2¼ years, and when killed was not very ill. But it was found to have very advanced tuberculosis, which however seemed to be in a very inactive stage, large collections of softened caseous matter in the lungs being surrounded by smooth walls which appeared almost as if granulating.

The three which were fed with bacilli belonging to Group II. died of general tuberculosis rather more rapidly than those fed with comparable doses of bacilli of Group I. The feeding experiments do not support the opinion that bacilli of Group I are more virulent for the monkey than those of Group II.

Baboons.

One baboon was fed, and one subcutaneously injected with culture of bacilli belonging to a virus of Group II. The one which was fed died of general tuberculosis after 108 days. There was no ulceration of intestine. The cervical and mesenteric glands were affected, the former the more severely. The baboon which was injected had not been well since its arrival, and was almost always observed to be shivering. It did not appear to be much affected by the injection, and died after 38 days, when early general tuberculosis was found. This did not seem severe enough to account for death, but no other cause of death was discovered.

Chimpanzee.

Two young chimpanzees were infected with tuberculosis, one by subcutaneous injection and the other by feeding, the virus in both cases belonging to our Group II, and the dose 1 mg. That which was subcutaneously injected died after 50 days, the other after 77 days. Both had general tuberculosis.

One chimpanzee was injected subcutaneously with 1·0 mg. of a virus belonging to Group I. It died of general tuberculosis after 79 days.

One injected subcutaneously at Walpole with the same dose of bovine tubercle bacilli died in 56 days. And two fed each with the same dose of bovine bacilli died in 56 and 63 days respectively. There is therefore no evidence that one kind of bacillus is more virulent than the other for the chimpanzee; both are capable in small doses either by feeding or subcutaneous injection of causing acute general tuberculosis.

RHESUS MONKEYS INJECTED WITH TISSUE EMULSIONS.

CLASS I.—Virus Virulent for Bovines.

Virus used.	Probable primary seat of disease in man	Immediate source of tissue emulsion injected.	Mode of infection.	Estimated dose of T.B.	No. of Monkey.	Fate of animal and condition at death.	Amount and range of tuberculous lesions at death
H 7. "C.M."	Mesenteric glands.	Human mesenteric glands, direct.	Subcut.	—	13	Died after 69 days	General Tuberculosis.

RHESUS MONKEYS INJECTED WITH CULTURES.

CLASS I.—Viruses Virulent for Bovines.

Subcutaneous injections.

Virus.	Probable primary seat of disease.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milli-grammes.	Number of Monkey.	Weight.	Fate of animal and condition at death.	Amount and range of tuber-culous lesions at death.
NONE.								

RHESUS MONKEYS INJECTED WITH TISSUE EMULSIONS—*continued.*

CLASS II.—Viruses slightly Virulent for Bovines.

Virus used.	Probable primary seat of disease in man.	Immediate source of tissue emulsion injected.	Mode of infection.	Estimated dose of T.B.	No. of Monkey.	Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
H 1. "A.M."	Lung.	Lesions of G.P.'s 108–111, from Cow 3.	Subcut.	—	1	Dying after 52 days	General Tuberculosis.
		Lesions from Monkey 3.	Subcut.	—	9	Died after 35 „	General Tuberculosis.
		Lesions from Monkey 9.	Subcut.	—	15	Dying after 25 „	General Tuberculosis.
		Lesions from Monkey 7.	Subcut.	—	11	Died after 48 „	General Tuberculosis.
[6. "U.H."	Mesenteric glands.	Human mesenteric glands, direct.	Subcut.	—	5	Dying after 37 „	General Tuberculosis.
[8. "S.C."	Mesenteric glands.	Human mesenteric glands, direct.	Subcut.	—	17	Died after 68 „	General Tuberculosis.

RHESUS MONKEYS INJECTED WITH CULTURES.

CLASS II.—Viruses slightly Virulent for Bovines.

Subcutaneous injections.

Virus.	Probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Mode of infection.	Number of Monkey.	Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
8. "S.C."	Mesenteric glands.	Human mesenteric glands, direct.	3⅓ years	1 mg.	Subcut.	71	Killed when well after 190 days.	General Tuberculosis, slight, and probably retrogressing.
		„ „	„	0·1 mg.	Subcut.	69	Killed (because it was paralysed) when in fair health, after 126 days.	General Tuberculosis.
		„ „	„	0·01 mg.	Subcut.	67	Killed when well after 199 days.	Tuberculosis, severe in thoracic glands, moderately severe in lungs and spleen, slight in liver. Kidneys normal.
61. "E.C."	Bronchial gland.	Human brain, through G.-P. 1837	1 month	1 mg.	Subcut.	77	Died after 113 days	General Tuberculosis.
		„ „	„	0·1 mg.	Subcut.	75	Died after 84 days	General Tuberculosis.
		„ „	„	0·01 mg.	Subcut.	73	Died after 89 days	General Tuberculosis.

FEEDING EXPERIMENTS ON RHESUS MONKEYS.

CLASS I.—Viruses Virulent for Bovines.

Virus.	Immediate source of material used for experiment.	Date of feeding: Quantity received: Duration of experiment.	No. of Monkey.	Fate of animal and condition at death.	Amount and range of tubercular lesions at death.
H 10. "B.S." [Mesenteric glands.]	Milk of Cow 295.	Fed daily, from 24th November, 1903, to 31st March, 1904 (128 days): the daily dose being about 30·0 cc.	61* Baby.	Killed when well after 128 days;	No tuberculosis. Rickets.
H 28. "C.L." [Cervical glands.]	Milk of Cow 143.	Fed once, on 14th September, 1904, with 90 cc. of milk, estimated to contain 55,000 T.B. per cc. [=5,000,000 T. B.]	63† Baby.	Died after 88 days	In both there was extensive ulceration of intestine, caseation of mesenteric glands, and general tuberculosis. The mouth and pharynx were normal. One small tubercle in a cervical gland of No. 63 only.
	Do.	Do.	65† Baby.	Died „ 80 „	
H 10. "B.S." [Mesenteric glands.]	Culture derived from Heifer 231.	Fed once only with a dose of 10·0 milligrammes of culture.	59‡	Dying after 79 days	In all three the glands of the neck and throat were enlarged and caseous, and there was tuberculosis of all the important organs. Except in No. 53, which had a few minute ulcers, the intestine and mesenteric glands had escaped altogether. In No. 59, however, there were a few caseous foci in the mesocolic and gastric glands.
	Do.	Dose: 1·0 milligramme.	55‡	Killed when ill „ 99 „	
	Do.	Dose: 0·1 milligramme.	53‡	Died „ 151 „	
	Do.	Dose: 0·01 milligramme.	51‡	Killed when apparently in fair health „ 2¼ years	General tuberculosis of all important organs, very severe in lungs and spleen. (Pharynx, tonsils, intestines, submaxillary and mesenteric glands normal.)

* Age about 7 months. † Age about 4 months. ‡ All four monkeys were quite small.

FEEDING EXPERIMENTS ON RHESUS MONKEYS.

Class II.—Viruses slightly Virulent for Bovines.

Virus.	Immediate source of material used for experiment.	Date of feeding: Quantity received: Duration of experiment.	No. of Monkey.	Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
		None.			

* All three monkeys were quite small.

BABOONS AND CHIMPANZEES INFECTED WITH CULTURE.

CLASS I.—Viruses Virulent for Bovines.

BABOONS.

Virus.	Probable primary seat of disease.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Mode of infection.	Number of Baboon.	Result. Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
				NONE.				

CHIMPANZEES.

Virus.	Probable primary seat of disease.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Mode of infection.	Number of Chimpanzee.	Result. Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
H 59. "L.B."	Mesenteric glands	Human brain, through G.P. 1860.	5½ months	1·0 mg.	Subcut.	5*	Died after 79 days.	General tuberculosis, very severe in intestine and intestinal lymphatic glands. (The alimentary infection was probably due to the animal swallowing the discharges from the ulcers on the back and in the axillæ).

* See also page 953.

BABOONS AND CHIMPANZEES INFECTED WITH CULTURE.

CLASS II.—Viruses slightly Virulent for Bovines.

BABOONS.

Virus.	Probable primary seat of disease.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Mode of infection.	Number of Baboon.	Result. Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
H 56. "F.T."	Lung	Human lung, through G.P. 1682.	6½ months	1· mg.	Fed	**1** *	Dying after 108 days	General Tuberculosis.
		,, ,,	,,	1· mg.	Subcut.	**3** *	Died after 38 days [having never been well].	Early General Tuberculosis. [Cause of death undetermined.]

* See also pages 921 and 922.

CHIMPANZEES.

Virus.	Probable primary seat of disease.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Mode of infection.	Number of Chimpanzee.	Result. Fate of animal and condition at death.	Amount and range of tuberculous lesions at death.
H 25. "A.T."	Lung	Calf 417, direct -	14½ months	1· mg.	Fed	**3** *	Died after 77 days	General Tuberculosis.
		,, ,,	,,	1· mg.	Subcut.	**1** *	,, ,, 50 ,,	General Tuberculosis.

* See also pages 586 and 588.

THE VIRULENCE OF TUBERCLE BACILLI OF HUMAN ORIGIN FOR THE DOG.

THE VIRULENCE OF TUBERCLE BACILLI OF HUMAN ORIGIN FOR THE DOG

The experiments, few in number, have with one exception been made with viruses belonging to Group II. All have been made with bacilli obtained from cultures.

With bacilli of Group II. four dogs have been infected by feeding ; two by subcutaneous, and two by intraperitoneal injection.

All these developed some amount of tuberculosis and in two the disease proved fatal.

One of these latter (No. 1) had been fed with 10 mg. of culture, on one occasion only. The virus came from a case of pulmonary tuberculosis in man, and is known as H.25 A.T. The dog developed severe tuberculosis of lungs, and died of pneumothorax and empyema, 94 days after infection.

The other, No. 15, was a puppy which had been injected intraperitoneally with 10 mg. of culture from the virus H 63. G.R. obtained from a case of primary mesenteric and cervical tuberculosis in man. It died in 48 days of general tuberculosis. Another puppy, No. 13, which had been injected at the same time was then apparently quite well. It was killed 85 days after inoculation, when the injection, which was to have been identical with that given to No. 15, was found to have been made only partly into the peritoneum and partly into the abdominal wall. There was only a small amount of tuberculosis, namely a fibro-caseous nodule in the abdominal wall, another in the omentum, and numerous little specks, which were probably tubercles, in the liver.

The two dogs which were injected subcutaneously, and the other three which were fed, with tubercle bacilli, were all in good condition when killed several months after injection. In the organs of all were some little grey tubercles, which were obviously in a retrogressing stage. Of the various organs the kidneys were the most often and most severely affected. All but one of the dogs which became only slightly affected, namely two of those which were infected by feeding, and the two which were subcutaneously injected, received a virus H. 8. S.C. which had been 3½ years under artificial cultivation, and may have been thereby slightly attenuated. Rhesus monkeys injected with this culture at the same time as the dogs, were less affected than other monkeys injected with similar doses of a recently isolated virus belonging to Group II.

Bearing this possibility in mind, and considering the smallness of the doses used, one was rather struck by the severity of the disease, ending as it did in two cases fatally, in a species which we had always understood to be comparatively resistant to tuberculosis.

One young terrier, No. 17, was injected in the peritoneal cavity with 10 mg. of a Group I. virus (H 59. L.B.). It died of acute general tuberculosis in 37 days. This animal, though a little older, is fairly comparable with dog 15, which died in 48 days after a similar injection of an equal dose of bacilli belonging to a virus of Group II.

This single experiment with bacilli of Group I. gives no indication of any great difference in the susceptibility of the dog to the two groups of human tubercle bacilli.

It is of course not possible to draw a close comparison from this single experiment, but if the results obtained with bacilli of Group II. be compared with those obtained by Dr. Griffith at Walpole with bacilli of bovine origin, it will appear that the dog shows no great difference in its susceptibility to the bovine tubercle bacillus on the one hand, and the common human bacillus (Group II.) on the other.

The full post-mortem notes on the dogs are given after the tables.

DOGS INFECTED WITH CULTURES.

Class I.—Viruses virulent for Bovines.

Virus.	Probable primary seat of disease.	Immediate source of culture.	Total duration of cultivation.	Dose in milligrammes.	Mode of infection.	No. of Dog.	Killed or Died.	Duration of life in days.	Result.
(*a*) Feeding Experiments.									
			None.						
(*b*) Subcutaneous and Intraperitoneal Injections.									
H 59. "L.B."	Mesenteric glands.	Human brain, through G.P. 1860.	5½ months	10· mg.	Intraperitoneal.	17	Died	37 days	Intense tuberculous peritonitis; acute general tuberculosis miliary tubercles in lungs and liver.

DOGS INFECTED WITH CULTURES.

Class II.—Viruses slightly virulent for Bovines.

Virus.	Probable primary seat of disease.	Immediate source of culture.	Total duration of cultivation.	Dose in milligrammes.	Mode of infection.	Number of Dog.	Killed or Died.	Duration of life in days.	Result.
				(*a*) Feeding Experiments.					
H 25. "A.T."	Lung	Calf 417, direct	14½ months	10· mg.	Fed	1	Died	94	Slight disease of mesenteric glands. Tuberculosis of lung. Pneumothorax and empyema.
		„ „	„	1·	Fed	3	Killed	191	Small number of small grey tubercles in lung, also one ⅛ in. in diameter, yellowish in colour. Rather numerous minute tubercles in kidneys; 3 in one suprarenal, 2 in spleen. Mesenteric glands enlarged, no tubercle.
H 8 "S.C."	Mesenteric glands	Human mesenteric glands, direct.	3⅓ years	10· mg.	Fed	5	„	100	In the kidneys were a moderate number of minute grey foci, (?) tubercles. Alimentary canal normal.
		„ „	„	0·1	Fed	7	„	100	Some minute grey tubercles in kidneys. Two pinhead tubercles in lungs. Alimentary canal normal.
				(*b*) Subcutaneous and Intraperitoneal Injections.					
H 8. "S.C."	Mesenteric glands	Human mesenteric glands, direct	3⅓ years	1· mg.	Subcut.	9	Killed	90	A very few small foci, (?) tubercles, in kidneys and liver. No lesion at seat of inoculation.
		„ „	„	1·	Subcut.	11	„	92	A very few small fibrous tubercles in lungs. No lesion at seat of inoculation.
H 63. "G.R."	Cervical and mesenteric glands	Human cervical glands, direct	8 weeks	10 mg.	Intraperitoneal (partly).	13 (puppy)	„	85	Fibro-caseous tuberculous nodule in abdominal wall and another in the omentum. Numerous little (?) tubercles in liver. Injection partly intramuscular.
		„ „	„	10·	Intraperitoneal.	15 (puppy)	Died	48	Acute tuberculous peritonitis; general tuberculosis.

POST-MORTEM EXAMINATIONS OF DOGS.

DOG 1. VIRUS H. 25 "A.T."

Fed with Culture derived from Calf 417.

Dose—10 milligrammes.

Date of Inoculation—October 25th, 1905.

Died—January 27th, 1906. [94 days after inoculation.] The animal had been very ill for some time, and became very thin. On the afternoon of the 27th it was found dead.

POST-MORTEM EXAMINATION.

The body was emaciated. There was no subcutaneous or abdominal fat.

The Tongue, Tonsils, Pharynx and Larynx.—Were normal.

The Cervical, Submaxillary, and Posterior-pharyngeal Glands.—Were normal.

The Omentum and Peritoneum.—Were normal.

The Stomach and Intestines.—Were normal.

The Mesenteric Glands.—Were not enlarged. They showed scattered minute opaque white foci in the cortices.

The Ileo-colic Glands.—Showed one or two similar foci.

The Colic, Rectal, Portal, Cœliac, Iliac, Duodenal, and Pancreatic Glands.—Were normal.

The Liver, Spleen, and Kidneys were normal.

Thorax.—The left pleural cavity contained about 10 cc. of yellow slightly frothy pus. There was a smaller quantity of yellow pus in the right pleural cavity. The left pleura was congested, and in the anterior part was covered with a thin layer of pus.

The Lungs.—Were collapsed; the left lung was dark and firm, and quite airless; the right lung was congested and showed dark red patches of collapse. At the apex of the left cephalic lobe there was a greyish yellow nodule about the size of a pigeon's egg; on the dorsal surface this showed a necrosed area 1 cm. in diameter with soft necrotic floor in which there was a small opening leading into a cavity in the anterior of the nodule; through this opening reddish pus could be expressed. In the ventral part of this lobe there was a pea-sized nodule with greyish yellow walls and a central cavity. On the dorsal part of the caudal lobe near the apex there was a firm greyish yellow nodule, slightly raised above the surface; on section it showed in the centre a pea-sized cavity containing a small quantity of yellow pus. This lobe also showed under the pleura two similar smaller nodules, the largest 7 mm. in diameter, each containing a small cavity; there was besides a nodule 2 mm. in diameter with yellow breaking-down centre and grey translucent margins.

In the depth of the right cephalic lobe there was a nodule the size of a split pea composed of grey translucent walls, and a central cavity containing yellow pus.

The right caudal lobe showed on the dorsal surface two slightly raised greenish yellow nodules, one 3mm. the other 5 mm. in diameter. On section, they were yellow and necrotic in the centre, and beginning to break down. Under the pleura on the ventral surface there was a small tubercle. In the depth of the lobe there was a cavity about 5 mm. in diameter with fibrous walls, showing on the internal surface the openings of small bronchi; there was also a small solid greyish yellow nodule.

The Bronchial Glands.—Appeared normal.

The Inguinal and Axillary Glands.—Were normal.

Microscopic Examination.

Pus from Pleural Cavity.—Tubercle bacilli.

Pus from nodule in Lung.—Tubercle bacilli.

Emulsion of Mesenteric Glands.—No tubercle bacilli.

Animals Inoculated.

With pus from pleural cavity (left).—Guinea-pig 1833. Died 31 days, general tuberculosis.

Emulsion of mesenteric glands.—Guinea-pig 1834. Died 82 days, general tuberculosis.

With softened contents of lung tubercle.—Rabbit 767. Died after 1 day of some acute infection.

DOG 3. VIRUS H. 25 "A.T."

Fed with Culture derived from Calf 417.

Dose—10 milligrammes.

Date of Inoculation—October 25th, 1905.

Killed when well—May 4th, 1906. [191 days after inoculation]. The dog was in good condition and fat.

POST-MORTEM EXAMINATION.

The Tongue, Tonsils, Pharynx.—Were normal.

The Submaxillary and Posterior-pharyngeal Glands.—Were normal.

The Omentum and Peritoneum.—Were normal.

The Intestines.—Were normal.

The Mesenteric Glands.—Appeared to be distinctly enlarged, but they showed no sign of tubercle.

Spleen.—On the surface of the spleen were two or three little pale elevations, (?) capsular tubercles. There were no tubercles in its interior. Some of the malpighian bodies appeared rather large.

Liver.—Two minute subcapsular foci of a pale colour were seen on the surface of the liver.

Portal Glands.—There were no glands seen in the portal fissure.

Kidneys.—There were rather a large number of minute tubercles seen under the capsule of each kidney, mostly minute whitish points rather well defined. About fifty were counted on the surface of one.

Suprarenals.—Three little tubercles were seen in the right suprarenal capsule.

Pleura.—Was normal.

Lungs.—A small number of tubercles were seen in the lungs, the largest being a little over one-eighth of an inch in diameter, of a yellowish colour. Another was grey, about the size of a small shot, and there were a good many others also dark grey and translucent, but a good deal smaller, and not very easy to see. Many of them were surrounded by little zones of emphysema, and they were quite easily felt as hard spots between the finger and thumb.

Bronchial Glands.—Were normal.

Heart.—Was normal.

Uterus.—Was normal.

Microscopic Examination.

Spleen, Focus from Surface.—1 tubercle bacillus seen.

Spleen, Malpighian Body.—No tubercle bacilli seen.

Suprarenal, Tubercle from.—No tubercle bacilli seen.

Lung, Tubercle from.—2 tubercle bacilli seen.

Liver, Spot from Surface.—No tubercle bacilli.

Kidney, Tubercle from.—2 tubercle bacilli seen.

DOG 5. (Terrier.) Virus H. 8. "S.C."

Fed with Culture—derived from human mesenteric glands, "S.C." direct.

Dose—10 milligrammes.

Date—April 3rd, 1906.

Killed when Well—July 12th, 1906. [100 days after inoculation.]

Weight at Death—25 lbs. 14 ozs.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Tongue, Pharynx, Palate, Larynx.—Normal.

Posterior-pharyngeal Lymphatic Glands.—Normal.

Intestines.—Normal.

Mesenteric Glands.—Normal.

The Lungs.—Showed some long waving translucent grey lines, of uniform width, less than 1 mm. in diameter, just under the visceral pleura.

The Spleen.—Showed a soft grey convoluted body, with a star-shaped centre, the colour of blood clot.

The Kidneys.—Showed a moderate number of minute grey tubercles (?) just under the capsule.

The rest of the organs and glands were examined, and found to be normal.

Miscroscopic Examination.

None.

Guinea-Pigs Inoculated.

With emulsion of kidney, 939–940. Killed 6 months later, and found to be perfectly healthy.

DOG 7. (Greyhound.) Virus H. 8. "S.C."

Fed with Culture—derived from human mesenteric glands, "S.C." direct.

Dose—0·1 milligramme.

Date of Inoculation—April 3rd, 1906.

Killed when well—July 12th, 1906. [100 days after inoculation.]

Weight at Death—34½ lbs.

POST-MORTEM EXAMINATION.

General Condition.—Good.

Tongue, Pharynx, Palate, Larynx.—Normal,

Posterior Pharyngeal Glands.—Normal.

Intestines.—Normal.

Mesenteric Glands.—Normal.

Lungs.—In the lungs were felt two small hard bodies about the size of pins' heads. One was fibrous and rather hard, the other was so calcareous that it could not be broken on a cover glass.

The Heart.—Contained a small cyst in one of the valves of the tricuspid.

The Kidneys were slightly pitted. Each contained a good many little grey points, about 1 mm. in diameter, visible on the surface.

The larger of these appeared on section as little grey tubercles, well defined, circular, with an opaque dot in the centre.

All the remaining organs and glands were examined and found to be normal.

Microscopic Examination.

Tubercle from Kidney.—Two tubercle bacilli seen.

Tubercle from Lung.—No tubercle bacilli.

Cyst from Heart.—No tubercle bacilli.

DOG 9. (Scotch Collie.) Virus H. 8. "S.C."

Subcutaneous Inoculation of culture derived from human mesenteric glands, "S.C." direct.

Dose—1 milligramme.

Date of Inoculation—April 3rd, 1906.

Killed when well—July 2nd, 1906. [90 days after inoculation.]

Weight at Death—29½ lbs.

POST-MORTEM EXAMINATION.

General Condition.—Good. There was a good deal of subcutaneous fat.

No trace of anything abnormal could be found at *the seat of inoculation* in the abdominal wall.

The Axillary Lymphatic Glands.—Were normal.

No Inguinal, Precrural, or Pubic Glands could be found.

Kidneys.—There were half a dozen small yellowish white spots, probably tubercles, the largest the size of a pin's head just under the capsule of the left kidney. There were three similar spots in the right. They were neither caseous nor calcified.

Two whitish spots, similar to those in the kidneys, were seen in the *Liver.*

The rest of the animal was healthy.

Microscopic Examination.

Focus from Kidney.—No tubercle bacilli seen.

Focus from Liver.—One short red body seen, (?) a tubercle bacillus.

DOG 11. (Greyhound.) Virus H. 8. "S.C."

Subcutaneous Inoculation of culture derived from human mesenteric glands. "S.C." direct.

Dose—1 milligramme.

Date of Inoculation—April 3rd, 1906.

Killed when well—July 4th, 1906. [92 days after inoculation.]

Weight at Death—37 lbs. 10 ozs.

POST-MORTEM EXAMINATION.

General Condition.—Good.

No trace of anything abnormal could be found at the *seat of inoculation* in the abdominal wall.

The Axillary Lymphatic Glands.—Normal.

No Precrural or Inguinal Glands could be seen.

Lungs.—About half a dozen very small, dark grey hard fibrous tubercles were found, circular, and well defined. These had no calcareous centres, but elsewhere in the lung a single little very hard calcareous grain was found.

Besides these were two hard shot-sized bodies of a red colour, neither caseous nor calcareous, not very well defined, and not in the least translucent like fibrous tubercles.

Mesenteric Glands.—One showed a fine mottling, which did not resemble tuberculosis.

The rest of the animal was healthy.

Microscopic Examination.

Scraping from Mesenteric Gland.—No tubercle bacilli.

Tubercle from Lung.—No tubercle bacilli.

DOG 13. (Young Puppy.) Virus H. 63. "G.R."

Intraperitoneal Inoculation of culture derived from human cervical glands, "G.R." direct.

Dose—10 milligrammes.

Date—May 3rd, 1906.

Killed when well—July 27th, 1906. [85 days after inoculation.]

POST-MORTEM EXAMINATION.

General Condition.—Good.

The Injection appeared to have been partly intramuscular, for there was a sort of abscess, containing thin pus, in the abdominal wall at the seat of injection.

This abscess bulged towards the peritoneum. It was about $\frac{3}{4}$ in. in diameter, and its thin walls were lined with mucus-like matter.

In the Omentum.—Was a firm nodule, rather more than $\frac{1}{2}$ in. in diameter. It was reddish-grey and fibrous; its centre was partly softened.

The Liver.—Showed on its surface a large number of minute, yellowish points, which may have been tubercles.

The Portal Glands.—Were normal.

Spleen, Kidneys, and Suprarenals.—Normal.

Uterus.—Normal.

Intestines.—Normal.

Mesenteric Glands.—Normal.

Lungs.—Normal.

Heart.—Normal.

Inguinal Glands.—Normal.

Microscopical Examination.

Pus from abscess in Abdominal Wall—Tubercle bacilli.

Softened centre of Nodule in Omentum.—Tubercle bacilli, numerous.

Specks from Liver.—No tubercle bacilli.

DOG 15. (Young Puppy.) Virus H. 63. "G.R."

Intraperitoneal Inoculation of culture derived from human cervical glands, "G.R." direct.

Dose—10 milligrammes.

Date—May 3rd, 1906.

Died—June 20th, 1906. [48 days after inoculation.]

POST-MORTEM EXAMINATION.

The Peritoneal Cavity.—Was distended with turbid yellow serous fluid.

The Omentum—Formed a very large lobulated mass, hæmorrhagic in parts. On section it was composed of greyish-red fibrous tissue, honeycombed with irregular cavities filled with bright yellow shreddy necrotic purulent material.

In the Gastro-Splenic Omentum—There was a smaller lobulated mass in which the necrosis was not so advanced.

The Parietal Peritoneum.—Was injected, slightly opaque (milky appearance), and showed on the left side numerous slightly raised discrete pearly tubercles, the largest the diameter of a pin's head.

The Peritoneum—Covering the diaphragm showed numerous minute transparent granules, and here and there a few larger yellowish tubercles.

The Mesentery.—Was congested and roughened. It showed between the vessels a number of flat greyish and greyish-yellow foci, as well as in several places irregular yellow tubercles, the largest the size of a millet seed.

The Mesentery of the Uterus.—Was congested, and had a yellowish mottled appearance, but there were no definite tubercles.

The Mesentery of the Duodenum.—Showed a number of somewhat flattened canary yellow necrotic masses, the largest 1 cm. in greatest diameter.

The Serous Surface of the Duodenum.—Was studded with minute transparent granules.

The Serous Surface of the Small Intestines.—Showed an eruption of minute transparent granules. These were most numerous along the mesenteric attachment.

The Pyloric Glands—about 1 cm. in greatest diameter, was composed throughout of canary yellow firm necrotic material.

A Gland in the Gastro-Splenic Omentum—the size of a French bean, showed in the cortex irregular bright yellow patches of necrosis.

Liver.—The surface of the liver was granular, due apparently to extremely numerous minute grey granules on the capsule.

The liver substance was congested, paler than normal, and had an appearance as if infiltrated throughout with small confluent grey tubercles.

The Portal Gland.—Was slightly enlarged, and had a yellowish appearance in the cortex as if from early necrosis.

The Spleen.—Was not enlarged, and showed on the surface a number of flattened congested filmy foci. On section the pulp was paler than normal, moderately firm, but showed no tubercles.

The Kidneys.—Were pale, and showed some diffuse patches of congestion. On the surface of the left two minute greyish white points were seen.

Suprarenals.—Not examined.

The Iliac Glands.—Were (?) slightly enlarged, and showed yellow necrotic foci in the cortex.

The Ileo-Colic Glands.—Also showed early necrosis.

The Right Lumbar Gland.—Was enlarged, yellow and necrotic throughout.

The Mesenteric Glands.—Were not enlarged. Some showed practically the whole of the cortex yellow and necrotic, and others showed a narrow yellow zone of beginning necrosis around the periphery, while others again appeared normal.

The Pleura.—Was normal.

The Heart and Pericardium.—Were normal.

Lungs.—The left caudal lobe and the ventral portion of the cephalic lobe were firm and dark red. Pieces sank in water. The rest of the lung was crepitant.

Evenly distributed throughout all the lobes were moderately numerous minute grey tubercles, none larger than 0·5 mm.

The Sternal Glands.—Were enlarged, and on section resembled the pyloric. Above the manubrium sterni there was a group of three enlarged glands, all of which were canary yellow and necrotic throughout.

An Intertracheo-bronchial Gland.—The size of a broad bean, showed part of its substance yellow and necrotic.

The Left Bronchial Gland.—Was enlarged, firm, yellow and necrotic throughout. The right was normal.

The Tongue and Pharynx.—Were normal.

The Pharyngeal Glands.—Were normal.

The Intestines.—Were normal.

The Cervical, Prescapular and Axillary Glands.—Were normal.

Microscopical Examination.

Scraping from Liver.—Tubercle bacilli numerous.

Scraping from Lung.—Tubercle bacilli numerous.

Scraping from Spleen.—Tubercle bacilli numerous.

Scraping from Hepatic Gland.—Tubercle bacilli very numerous.

Scraping from Kidney.—Tubercle bacilli.

DOG 17. (Virus H 59. "L.B.")

Intraperitoneal Inoculation of culture derived from human brain, "L. B.," through G.P. 1860.

Date—16th August, 1906.

Dose—10 milligrammes.

Died—September 22nd, 1906. [37 days.]

Weight at death—13 lbs. 14 ozs.

POST-MORTEM EXAMINATION.

General Condition.—Very thin.

In the Subcutaneous Tissues of the abdominal wall immediately to the left of the penis there was a flat space, 1½ in. in greatest diameter, lined with pale granulation tissue; the skin forming the anterior wall showed the orifices of two sinuses which led into the cavity.

The Right Spermatic Cord was about the thickness of a cedar wood pencil, and showed on section surrounding the cord, which appeared to be patent, firm translucent grey tissue containing yellow necrotic streaks.

The Right Tunica Vaginalis was filled and distended with yellow pus. Both layers of the tunica were opaque and thickened. The left cord resembled the right, but was not in so advanced a condition.

The tunica contained a small quantity of turbid fluid, and the internal surface was thickened, opaque, and showed some yellow purulent foci.

The Peritoneal Cavity was filled with bloodstained clear serous fluid.

The Omentum was retracted, thickened, and adherent to the floor of the abdomen, stomach, spleen, and many of the coils of the small intestines. It was thickest near the pyloric end of the stomach, was composed of firm rather œdematous grey tissue penetrated with yellow streaks of necrosis.

Small Intestine.—Many of the coils of the small intestine were glued together, but were readily separated from each other. The serous surface was congested, and showed patches of adherent, fibrinous, and in some places fibrino-purulent lymph.

The Mesentery was thickened, contracted, opaque, and yellowish, especially along the great vessels.

The Parietal Peritoneum on the floor of the abdomen showed flakes of lymph similar to those on the intestines, and on the right side there was an eruption of minute grey granules.

The Central Tendon of the Diaphragm had a yellowish streaky appearance, and the muscle was covered with an extremely delicate honeycombed greyish fibrinous membrane.

The Spleen was perhaps slightly enlarged, and was adherent along the whole of its anterior surface to the thickened omentum. It showed on its convex surface a few minute grey granules. On section the pulp was a little softer and paler than normal, but showed no tubercles.

The Liver was congested, being of a bright red colour, and closely infiltrated with minute grey tubercles.

The Portal Glands were not apparently enlarged, and showed no sign of necrosis on section.

Kidneys.—The serous surface of each kidney was covered with a thin greyish yellow tuberculous membrane which could be easily peeled off. The organs were pale, but no tubercles could be seen in them. The pelvis of each kidney was normal.

Under the peritoneum just posterior to the right kidney there was a small collection of yellow pus.

Suprarenal Bodies.—Normal.

The Lumbar Glands were enlarged, indurated, and showed on section in one case a yellowish network, and in another a canary yellow mottling, chiefly in the medullary portion.

Pleura.—The left pleural cavity was half filled with reddish serous fluid. The right pleural cavity was about a quarter filled.

The parietal pleura was congested. On the left side of the diaphragm and over the posterior ribs it showed numerous flakes of soft yellow fibrinous pus. There were a few small flakes of yellow lymph on the right side of the diaphragm and near the anterior opening of the thorax. The lungs were free from adhesions.

The Lungs were collapsed. They were firm, reddish in colour and closely beset with grey tubercles, somewhat irregular in outline, and forming in places a kind of network; the tubercles showed no sign of central necrosis. When placed in water only the central tips of the cephalic and the thin margins of the caudal lobes were found to be air-containing; the rest of the lungs sank in water.

The Bronchial Glands were enlarged, and showed some irregular patches of necrosis, canary yellow in colour.

The Ventral Mediastinal Glands were enlarged, and were more extensively necrosed than the bronchial, one showing a cavity filled with thick yellow pus.

Heart and Pericardium.—Normal.

Tongue, Pharynx and Palate.—Normal.

Submaxillary and Posterior-pharyngeal Lymphatic Glands.—Normal.

A Gastric Gland in the lesser curvature contained a yellowish necrotic focus 1·5 mm. in diameter.

Intestines.—The mucous surface of the small and large intestines was normal.

The Mesenteric Glands were perhaps a little enlarged, but on section were not obviously tuberculous. One in the anterior part, however, showed a suspicious yellow streaky appearance.

Ileo-colic Glands.—Normal.

Inguinal Glands.—Normal.

Microscopic Examination.

Pus from Tunica Vaginalis.—Tubercle bacilli numerous.

Mesenteric Gland—normal to the eye (*scraping from*).—No tubercle bacilli.

Lumbar Gland (*scraping from*).—Tubercle bacilli numerous.

Spleen (*scraping from*).—Tubercle bacilli numerous.

Pus from Pleura.—Tubercle bacilli numerous.

Bronchial Gland (*scraping from*).—Tubercle bacilli numerous.

THE VIRULENCE OF TUBERCLE BACILLI OF HUMAN ORIGIN FOR THE CAT.

THE VIRULENCE OF TUBERCLE BACILLI OF HUMAN ORIGIN FOR THE CAT.

Few experiments only were made with the cat; but they are sufficient to show that this species is highly resistant to tuberculosis caused by the common human tubercle bacilli, namely, that which constitutes our Group II., while it is more susceptible to that caused by the bacilli of Group I. The experiments are too few in number to determine how great that susceptibility is, but they are sufficient to show that the cat possesses a considerable amount of resistance to the bacilli of this group also, at least when introduced by way of the alimentary canal.

One cat (No. 1) was fed with a large quantity of lung swarming with bacilli belonging to Group II. The virus was H. 22, F.W., and the lungs those of Calf 339, which had been intravenously injected. In an emulsion made from this lung nearly 14,000,000 tubercle bacilli per cubic centimetre were estimated, so the dose given to this cat must have been enormous. Nevertheless it remained well and when it was killed 148 days later it showed no signs of tuberculosis.

Cat No. 9 was given an intraperitoneal injection of 10 mg. of culture belonging to the Virus H. 8, S.C. It remained apparently quite well for 116 days; and after it had been killed there were found in the mesentery several minute translucent grey foci which were almost certainly retrogressing tubercles, and in the left lung, several little hard nodules about $\frac{1}{16}$ in. in diameter; they were about the same colour as the rest of the lung and could be more easily felt than seen, but some were darker and had yellowish centres. No tubercle bacilli could be seen in them, but it could not be doubted that they were tubercles though retrogressive ones.

These two are the only experiments with viruses of Group II., but they suffice to show the high resisting power of the cat to this kind of tubercle bacilli.

Three cats were fed with the milk of Cow 143, containing tubercle bacilli of Group I., belonging to the Virus H. 28, F.L. This milk was rich in tubercle bacilli.

Cat 3 was fed daily with milk from the fifth day after the intramammary injection of the cow, so that it might receive a small dose of bacilli at first, and that this should be increased gradually. Nos. 5 and 7 were fed for 7 and 4 days respectively with milk which was already yellow and serous and rich in bacilli. A sample taken from the right hind quarter about this time was found to contain 55,000 tubercle bacilli per cubic centimetre. Cat 3 died after 100 days of acute pleurisy. Cocci were found in the pleural fluid and lymph, but no tubercle bacilli. The lungs showed numerous little whitish grey nodules which projected on the surface; they were translucent and had no central opacities. They contained no tubercle bacilli, but were probably retrogressive tubercles. The liver was speckled with little pale spots but no tubercle bacilli could be found in them. On the other hand the thoracic and mesenteric glands were enlarged and contained caseous nodules and foci. Tubercle bacilli were found in both.

Cat 5 died of acute pneumonia 12 days after Cat 3, that is to say, 112 days after the commencement of the feeding.

The body was extraordinarily emaciated. The tongue, pharynx, stomach, and intestines, as well as the pharyngeal and mesenteric lymphatic glands, were perfectly normal. The lungs were severely diseased, both posterior lobes being solid, in a stage of grey hepatization, and both anterior lobes studded with little solid nodules, some as large as $\frac{1}{4}$ of an inch. There were probably tubercles, and tubercle bacilli were numerous in them. The bacilli were mostly contained in cells. Only one tubercle bacillus was seen in a scraping from the pneumonic part, but no other micro-organisms could be seen either in specimens stained with gram or methylene blue. The bronchial glands, the spleen and kidneys appeared normal, but the liver was faintly mottled, and in the middle of the left lobe was a tumour, nearly $\frac{1}{2}$ in. in diameter, which presented no resemblance to a tuberculous lesion. No tubercle bacilli were found in it.

Cat 7 was killed 193 days after the commencement of the feeding. One of the mesenteric glands lying in the angle at the junction of the small and large intestines contained several calcareous foci. One gland lying in the midst of the mesenteric glands contained a caseo-calcareous focus. The lungs contained many old fibrous tuberculous foci, some of which had calcareous centres. The liver was fatty, the alimentary tract and other organs were normal. Tubercle bacilli were found in both the affected mesenteric glands.

These experiments do not indicate a high degree of susceptibility to bacilli of Group I, when given by feeding to adult cats; but they are insufficient to determine exactly the virulence of tubercle bacilli of this kind for the species.

Cats are highly resistant to the common bacillus of human tuberculosis, and are not likely to become infected from their human masters and mistresses when these are phthisical.

FEEDING EXPERIMENTS ON FOUR CATS.†

Virus.	Direct source of material used for experiment.	Date of feeding: Quantity received: Duration of experiment, etc.	Number of Cat.	Killed or died.	Duration of life in days.	Results.
Class I.—Virus virulent for bovines.						
H 28. "C.L." - [Cervical glands]	Milk from injected quarters of Cow 143 [commencing on the fifth day after her inoculation], in order to begin with a small dose, and gradually increase it.	Fed twice a day. About 1½ pints daily, for twelve days, from 18th to 30th August, 1904. Towards the end of the period the milk was yellow and serous, 1½ pints being all that was yielded from the infected quarters per day. For other inoculations of the milk at this time, see G.P.'s 400–403. For estimation of bacilli in milk from R.H. quarter, on 15th September, see Cat 7.	3	Died. Death due to other causes.	100	The mesenteric and thoracic glands were caseous and contained T. B. Some (?) fibrous tubercle were seen in lungs, but no tubercle bacilli were found in them. The liver was speckled with pale points. No tubercle bacilli were found in them. Death was due to acute pleurisy.
„ „	Do. do. [Commencing on the 17th day after inoculation], in order to begin with a large dose.	Fed daily for seven days (31st August to 7th September, 1904) with all the milk from the infected quarters. On the first day of feeding less than ½ pint was obtained from each quarter. The milk was yellow and serous.	5	Died. Death due to other causes.	112	Pneumonia. Grey hepatisation of both posterior lobes. Fibrous tubercles, with T. B., numerous, but mostly in cells in the anterior lobes. Alimentary canal and neighbouring glands normal. Some specks in liver similar to those in Cat 3; [no tubercle bacilli seen.]
„ „	Do. Do. [Commencing on the 25th day after injection, and ended the day before death], in order to begin with a large dose.	Fed daily for four days (15th to 19th September, 1904) with all the milk obtainable from the infected quarters. On the 15th less than ½ pint was obtained from them. The T. B. at this time were fairly numerous in the R. H. quarter. The milk from the R. H. collected on 12th, 13th and 14th mixed, together measured 200 cc., and was estimated to contain 55,500 T. B. per cc. The milk from the L. F. quarter contained so few T. B. that they could not be found.	7	Killed.	193	In an ileo-colic and in one mesenteric gland large calcareous foci containing T. B. were seen. Intestine normal. Numerous irregular grey fibrous tubercles, with minute calcareous foci, in lungs.
Class II.—Virus slightly virulent for bovines.						
H 22. "F.W." - [Lung]	Lungs of Calf 399 -	Fed on one occasion only, 7th June, 1904, with large quantities of lung tissue swarming with tubercle bacilli.	1	Killed.	148	No tuberculosis.

INTRAPERITONEAL INJECTION INTO ONE CAT.†

Class II.—Virus slightly virulent for bovines.

Virus.	Probable primary seat of disease in man.	Details of experiments.	Mode of infection.	Dose.	Number of Cat.	Killed or died.	Length of life in days.	Result.
H 8. "S.C." -	Mesenteric glands.	Injected with culture derived from human mesenteric glands.	Intra-peritoneal.	10 mg.	9	Killed.	116	Several minute translucent foci on mesentery. Several small fibrous nodules, containing yellowish foci, in left lung.

† All were adult animals.

THE VIRULENCE OF TUBERCLE BACILLI OF HUMAN ORIGIN FOR THE RAT.

THE VIRULENCE OF TUBERCLE BACILLI OF HUMAN ORIGIN FOR THE RAT.

The rat, though relatively insusceptible when compared with many other animals, was nevertheless found to be capable of developing a slowly progressing and fatal tuberculosis of a peculiar kind, the principal characteristics of which were the comparatively slight amount of new tissue formation and the enormous multiplication of tubercle bacilli.

The dose necessary to produce this condition was large. Over 5,000,000 bacilli, belonging to Group I, and contained in an emulsion of tuberculous tissue, failed to produce tuberculosis (in Rats 13 and 14) either by subcutaneous or intraperitoneal injection, and even so large a dose as 95,000,000 injected subcutaneously (Rat 25) failed also, the animal dying from other causes 592 days after injection. On the other hand, large doses of culture, 33 mg. and upwards, injected into the peritoneum have invariably proved fatal from tuberculosis.

The disease in the rat was slow, and in some cases ended fatally, a year or more—in one case a year and eight months—after injection.

No matter how large was the dose, the rats never died early, or suffered from any immediate ill effects; even 100 mg. of culture appeared to cause no disturbance of health for several months. In this respect they were unlike the rabbits, which, as already stated, might die shortly after large injections of viruses which did not cause progressive tuberculosis in other rabbits. Though there was no immediate or proximal effect in the rats, still the disease following large doses was always progressive. One must therefore suppose that they are insusceptible to the toxins of the tubercle bacillus; and this opinion is supported by the remarkable numbers of bacilli found in their bodies after death; for one would suppose if they were susceptible to the toxins they would die like other animals do before the bacilli had multiplied to this extent. In some cases a smear from one of the organs examined microscopically appeared more like a preparation from an artificial culture.

Very little tissue reaction or new formation occurred, and organs which were swarming with tubercle bacilli might appear normal to the naked eye, or merely swollen and congested. On the other hand, some approach to tubercle formation was often seen in the lungs, and the kidneys frequently appeared granular, but the tubercles showed little tendency to degenerate, and caseation and necrosis was rare.

The following description of a rat (No. 42) which died exactly a year after the intraperitoneal injection of an emulsion of tuberculous tissue, may be taken as representative of the lesions visible to the naked eye, though the bacilli were not so numerous as usual.

"There were no tubercles in the peritoneum. The lungs did not contract well, and their surfaces were strongly marked by a coarse greyish network, with bright scarlet intervals. This network was composed of well-defined wavy lines, somewhat translucent and mottled by more opaque whitish points. Under a magnifying glass bright scarlet parts were seen to contain air, and they looked rather emphysematous.

"The other organs had a fairly normal appearance.

"Tubercle bacilli were numerous in an emulsion made from the lung, and some were seen in a preparation of the spleen. None were found in the liver or kidney."

Another example may be given, namely, Rat 28, which died 172 days after an intraperitoneal injection of 100 mg. of culture belonging to Group II.

"In the right side of the pelvis was a collection of rather dry yellow caseous matter, the size of a small pea; another between the liver and diaphragm and several nodules of similar material in the omentum. There were two or three little round tubercles, less than a pin's head in size, in the mesentery, and two pin-point tubercles in the right meso-testes. The spleen was rather large, but apparently normal. There was a caseous spot in the liver. The kidneys were mottled all over with a dark moss-like network. The lungs were uniformly and finely mottled with a reddish moss-like pattern, with pale intervals. The latter, seen with a hand lens, were found to be emphysematous, the red tissue airless and translucent.

"The lungs were found to be swarming with tubercle bacilli in large tangled masses. The caseous collections in the peritoneum were also swarming with bacilli, but these were much broken up into granules. In the spleen the numbers of the bacilli were more moderate, but sometimes they were also seen in masses. There were a moderate number in the kidneys."

With regard to the question of the relative susceptibility of the rat to our Groups I. and II., it can only be said that they are susceptible to bacilli belonging to both groups; and while the evidence seems to point to Group I. being rather the more virulent of the two for this species, the evidence is not sufficient to be conclusive. The following analysis of the culture injections may be useful.

Group I.		Group II.	
Dose.	Duration of Life.	Dose.	Duration of Life
100 mg.	33 days.	100 mg.	113 days.
100 ,,	85 ,,	100 mg.	162 ,,
		100 mg.	172 ,,
		100 mg.	413 ,,
75 ,,	213 ,,	80 mg.	97 ,,
70 ,,	52 ,,	74 mg.	87 ,,
50 ,,	67 ,,		
30 ,,	258 ,,		

There is no close correspondence between dose and duration of life, so that we may perhaps compare the average duration of the two groups although the doses are different. This works out as follows:—

Average duration of life of 6 rats injected with Group I.—116 days.

Average duration of life of 6 rats injected with Group II.—174 days.

If we exclude the animal which received the comparatively small dose of 30 mg. of bacilli of Group I, the average for this group is much smaller, namely, 90 days. But in any case the difference in susceptibility to the two groups is not great.

Feeding.

A few rats were fed daily, and for long periods of time, on tuberculous milk, and on the most infected organs of the guinea-pigs which came to post-mortem examination day by day. They must have consumed truly enormous quantities of tubercle bacilli belonging to both our groups, and to many viruses, and yet they did not suffer from tuberculosis: at most tubercle bacilli were found in apparently normal mesenteric or submaxillary glands, and in two instances a few small white foci containing a few tubercle bacilli were found in the lungs. One animal wa fed almost daily for over a year, and yet when it was killed it was found to be quite healthy.

These experiments, though few in number, show the great powers of resistance of the rat to tuberculosis communicated by what one must suppose in this animal to be the most natural channel.

CULTURE INJECTIONS INTO RATS.

Class I.—Viruses Virulent for Bovines.

All Intraperitoneal.

Virus.	Probable primary seat of disease.	Immediate source of culture injected.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Rat.	Weight in grammes.	Killed or died.	Duration of life.	Result.
H 28. "C.L."	Cervical glands.	Human cervical glands, direct.	13 months	100 mg.	**39**	180	Died	33 days	General dissemination of tubercle bacilli. Some small caseous foci in the pelvis, and a caseous nodule in the omentum. Lungs were congested, but no tubercles were seen. The kidneys were speckled with little dark points.
H 29. "M.F."	Cervical glands.	Human cervical glands, through G.P. 1,329.	8 months	50 mg.	**35**	200	„	67 „	General dissemination of tubercle bacilli. Lungs large and darkly congested, peppered with minute grey tubercles. Spleen very large. Kidneys granular.
			11 months	100 mg.	**41**	100	„	85 „	Tubercle bacilli in lungs and liver. Lungs mottled by a whitish network. Other organs apparently healthy. Some of the mesenteric glands were tuberculous.
H 20. "F.L."	Mesenteric glands.	Calf 213, direct	8 months	70 mg.	**33**	270	„	52 „	General dissemination of tubercle bacilli. Lungs congested but showed no definite tubercles. Spleen much enlarged.
H 49. "T.C."	Mesenteric glands.	Human mesenteric glands, direct.	5 months	75 mg.	**46**	160	„	213 „	General dissemination of tubercle bacilli. Lungs large, congested and mottled, showed no definite tubercles. Spleen large. Kidneys finely mottled.
H 16. "J.H."*	Knee-joint	Bull 423A, direct	3 months	30 mg.	**30**	210	„	258 „	General dissemination of tubercle bacilli. Lungs mottled with a network of more or less confluent irregular red patches. Spleen much enlarged.

* After increase of virulence.

CULTURE INJECTIONS INTO RATS.

CLASS II.—Viruses slightly virulent for Bovines.

All Intraperitoneal.

Virus.	Probable primary seat of disease.	Immediate source of culture injected.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Rat.	Weight in grammes.	Killed or Died.	Duration of Life.	Result.
H 17. "Sp. B." *	Lung	Calf 339, through G.P. 1,235.	8 months	80 mg.	**34**	160	Died	97 days	General dissemination of tubercle bacilli. Kidneys faintly mottled with small dark spots. Lungs large and heavy, showing pink translucent patches. Other organs normal.
H 50. "P.H"	Lung	Human lung, through G.P. 1,490.	3 months	74 mg.	**40**	260	„	87 „	General dissemination of tubercle bacilli. Omentum slightly thickened. Spleen enlarged. Lungs large and mottled and partly consolidated, swarming with masses of tubercle bacilli. No tubercles seen in liver or kidneys.
H 54. "C.W."	Bronchial gland (?)	Human spleen, through G.P. 1,609.	2 months	85 mg.	**45**	170	„	13 „	Omentum thickened, contained yellow nodules probably consisting of the culture injected. Spleen large. Other organs apparently normal. Tubercle bacilli numerous in liver, few in lungs, absent from kidneys.
H 16. "J.H." *	Knee-joint	Human synovial membrane, through G.P. 609.	14 months.	100 mg.	**28**	190	„	172 „	General dissemination of tubercle bacilli. Caseous nodules in peritoneal cavity. Lungs mottled with a reddish translucent solid network. Spleen large. Kidneys mottled with dark spots.
		„ „	„	100 mg.	**29**	„	„	413 „	Chronic tuberculosis of omentum and kidneys. Omentum contained six well-defined cream coloured shot-sized tubercles. The kidneys appeared granular. The lungs large and slightly mottled. Tubercle bacilli were numerous in the kidneys, but were not found elsewhere.
H 47. "S.B."	Hip-joint	Human synovial membrane, through G.P. 1,430.	4½ months	100 mg.	**37**	200	„	113 „	General dissemination of tubercle bacilli. Omentum contained a small caseous mass. Spleen was enlarged and apparently packed full of minute grey well-defined tubercles. Kidneys showed numerous little dark grey points on their surfaces. Lungs large, dark red, partly solid, finely mottled with irregular tubercles.
		„ „	„	nearly 100 mg.	**38**	150	„	162 „	General dissemination of tubercle bacilli. Lungs as in Rat 37. Spleen enlarged, but showed no tubercles. Kidneys apparently normal.

* This virus was afterwards increased in virulence by passage through calves.

"TISSUE EMULSION" INJECTIONS INTO RATS.

Class I.—Viruses virulent for Bovines.

Virus.	Probable primary seat of disease.	Immediate source of tissue emulsion injected.	Estimated number of tubercle bacilli injected.	Mode of injection.	Number of Rat.	Weight in grammes.	Killed or Died.	Duration of life in days.	Result.
H 28. "C.L."	Cervical glands	Calf 515. Prepectoral gland	95,075,000	Intraperit.	24	210	Died	340 days	Visible lesions in lungs. Tubercle bacilli in organs. Lungs large, congested, mottled. Spleen enlarged. Liver and kidneys normal.
		,,	95,075,000	Subcut.	25	160	,,	592 ,,	Death from causes other than tubercle. Abscesses in lungs. No tubercle bacilli in the pus, or in any of the organs.
		Calf 489. Prepectoral gland	Probably large	,,	26	220	,,	603 ,,	Death probably due to volvulus of cæcum. Lungs large, congested, and mottled; swarming with tubercle bacilli.
		,,	,,	Intraperit. (partly subcut.)	27	300	,,	343 ,,	General dissemination of tubercle bacilli. Lungs voluminous and mottled. Spleen enlarged. Other organs apparently normal.
H 19. "S.W."	Mesenteric glands	Calf 271. Prescapular gland	5,344,000	Intraperit.	13	150	Killed	180 ,,	No tuberculosis.
		,,	5,344,000	Subcut.	14	110	,,	180 ,,	,, ,,
H 32. "Y.W."	Mesenteric gland	Calf 533. Prescapular gland	Large	Intraperit.	32	230	Died	424 ,,	General dissemination of tubercle bacilli. Lungs large, and mottled with irregular, dark, mahogany-coloured areas more or less confluent. Spleen much enlarged. Kidneys granular.
H 13. "A.D."	Bronchial gland	Calf 301. Mediastinal gland	49,666,000	,,	15	120	Killed	167 ,,	General dissemination of tubercle bacilli. Fibrous tubercles in peritoneum. Spleen enlarged. Lungs partly consolidated by confluent translucent patches. Kidneys normal.
		,,	49,666,000	Subcut.	16	100	,,	167 ,,	Normal throughout.
H 16. "J.H."*	Kneejoint	Lesions from Rat 28	Very large	Intraperit.	36	180	Died	135 ,,	General dissemination of tubercle bacilli. Spleen large. Lungs large and mottled. No definite tubercles.
,, ,,	,,	Lesions from Rat 36	,,	,,	42	260	,,	365 ,,	Tubercle bacilli in lungs and spleen, absent from liver. Lungs strongly marked by a coarse greyish-white translucent solid network, with bright scarlet air-containing intervals. Other organs appeared normal.

* After increase of virulence.

"TISSUE EMULSION" INJECTIONS INTO RATS.

CLASS II.—Viruses slightly virulent for Bovines.

Virus.	Probable primary seat of disease.	Immediate source of tissue emulsion injected.	Estimated number of tubercle bacilli injected.	Mode of injection.	Number of Rat.	Weight in grammes.	Killed or Died.	Duration of life in days.	Result.
NONE.									

CULTURE INJECTIONS INTO RATS—*continued.*

CLASS III.—Virus not susceptible of being placed either in Class I. or II.

Origin of Virus: Human Tuberculosis, believed to be primary in skin (Lupus).

Intraperitoneal Injection.

Virus.	Probable primary seat of disease in man.	Immediate source of culture.	Total duration of artificial cultivation.	Dose in milligrammes.	Number of Rat.	Weight in grammes.	Killed or died.	Duration of life after inoculation.	Result.
H 53. "D.H."	Skin [Lupus]	Diseased tissue, through G.P. 1482.	8½ months	100 mg.	**43**	220	Died	258 days	General dissemination of tubercle bacilli. Visible tubercles in omentum and kidneys.

FEEDING EXPERIMENTS ON ELEVEN RATS.

Virus.	Immediate source of material used for experiment.	Quantity received : Date of feeding : Duration of experiment.	No. of Rat.	Killed or Died.	Duration of life in days.	Results.
Various viruses, (both virulent and slightly virulent for bovines)	Tissues from tuberculous Guinea-pigs.	Fed almost daily from 25th November, 1903, to 17th February, 1904 (84 days).	1	Died	84	Tubercle bacilli found in apparently normal mesenteric gland, and submaxillary gland ; but not in liver. Cause of death not apparent.
	,,	Fed daily from 25th November, 1903 to 13th February, 1904 (80 days).	2	Killed	80	Tubercle bacilli found in apparently normal mesenteric gland ; but not in spleen
H 10. "B.S." - (virulent for bovines)	Milk of Cow 295* and tissues from tuberculous Guinea-pigs. [*On 15th May, 1904, the cow died, and after this no more infected milk was available.]	Fed almost daily from 18th February, 1904, with tuberculous tissues during the whole period of the experiment, and also with the cow's milk during the first three months.	17	Killed	368	Healthy.
		,, ,,	18	Died	5	No tuberculosis
		,, ,,	19	Killed	368	Healthy.
		,, ,,	20	Died	340	Two or three small white foci, containing few tubercle bacilli, in lungs.
		,, ,,	21	Died	19	No tuberculosis.
		,, ,,	22	Killed	388	A few minute tubercles in lungs, containing a few bacilli.
		,, ,,	23	Died	302	No tuberculosis.
H 10. "B.S." - (virulent for bovines)	Milk of Cow 295	Fed daily from 25th November, 1903 to 14th April, 1904 (141 days).	3	Killed	141	Healthy.
	,,	Fed daily from 25th November, 1903 to 13th February, 1904 (80 days).	4	Killed	80	Healthy.

THE VIRULENCE OF TUBERCLE BACILLI OF HUMAN ORIGIN FOR THE MOUSE.

THE VIRULENCE OF TUBERCLE BACILLI OF HUMAN ORIGIN FOR THE MOUSE.

Few experiments only have been made with the mouse, and those with bacilli of Group I. only. So far as they go they show that the mouse reacts something like the rat to these bacilli, in being highly resistant to tubercle bacilli introduced into the alimentary canal, and in enduring the development of enormous numbers of tubercle bacilli in the lesions which follow injection. But no mice died of tuberculosis, and none lived long enough to show whether or not tuberculosis in them is progressive as it is in the rat.

Eight mice were fed like the rats. They must have swallowed enormous quantities of tubercle bacilli belonging to various viruses, and yet they resisted infection. By way of comparison, Mouse 2 may be mentioned, which received a subcutaneous inoculation containing 2,672,000 tubercle bacilli in an emulsion of the prescapular gland of Calf 271, "H. 19 S.W." When killed 35 days later, a few translucent tubercles, extraordinarily rich in tubercle bacilli, were found in the lungs. In Mouse 3, which died 14 days after a similar injection, a caseous focus, with tubercle bacilli, was found near the inguinal glands.

FEEDING EXPERIMENTS ON EIGHT MICE.

Viruses used.	Immediate source of material used for Experiment.	Date of Feeding : Quantity received : Duration of Experiment.	No. of Mouse	Killed or Died.	Duration of life in days.	Results.
H 10. "B.S." [Virulent for bovines] and many other viruses.	Milk of Cow 295, and tissues from tuberculous Guinea-pigs.	Fed almost daily (from 18th February, 1904), with tuberculous tissues during the whole period of the experiment, and also with the cow's milk during the first three months. [The cow died 15th May, 1904.]	5	Died	40 days	No tuberculosis.
	,,	,, ,,	6	,,	79 ,,	,, ,,
	,,	,, ,,	7	,,	82 ,,	,, ,,
	,,	,, ,,	8	,,	82 ,,	,, ,,
	,,	,, ,,	9	,,	223 ,,	,, ,,
	,,	,, ,,	10	,,	223 ,,	,, ,,
	,,	,, ,,	11	Killed	224 ,,	Healthy.
	,,	,, ,,	12	,,	224 ,,	,,

MICE INJECTED WITH A VIRUS OF GROUP I.

Virus.	Immediate source of tissue emulsion.	Dose of tubercle bacilli injected.	Mode of inoculation.	No. of Mouse.	Killed or died.	Duration of life in days.	Result.
H 19. "S.W." [Mesenteric glands]	Calf 271, prescapular gland.	2,672,000	Subcut.	2	Died	35 days	In the lungs were one or two small circular spots like ground glass. Extraordinary numbers of tubercle bacilli were found in them. There were no other tuberculous lesions. Death due to hæmorrhage from the thoracic aorta.
	,,	,,	,,	3	,,	14 ,,	There was no lesion at the seat of inoculation. In or near the inguinal gland was a small caseous focus, containing tubercle bacilli. There was no other tuberculous lesion. Cause of death unknown.
	,,	,,	Intrap.	4	,,	10 ,,	No tuberculosis. Cause of death unknown.

THE VIRULENCE OF TUBERCLE BACILLI OF HUMAN ORIGIN FOR THE FOWL.

THE VIRULENCE OF TUBERCLE BACILLI OF HUMAN ORIGIN FOR THE FOWL.

A few experiments were done with fowls in order to determine to what extent, if any, this species is susceptible to tuberculosis caused by tubercle bacilli of human origin.

The results show that occasionally, in certain individuals, a small amount of tuberculosis can be set up.

The mode of infection employed was both feeding and intraperitoneal injection; and both adult birds and very young chickens were used.

In addition to this eggs were inoculated and incubated. In all these experiments cultures were used, and strains of bacilli belonging to both the human groups were tested.

Adult Fowls.

Two adult birds only were fed: No. 1 with 10 mg. of culture from the Group I. strain H 31, F.L., and No. 4 with 35 mg of the Group II. strain, H 56, F.T. In neither was any tuberculosis found when the animals were killed three and a half months later.

Five adult birds were intraperitoneally injected:

No. 2 with 10 mg. of culture derived from the Group I strain H 31, F.L. It developed no sign of tuberculosis.

The others were injected with strains which belong to Group II. No. 3 received 10 mg. and No. 5 15 mg, of culture derived from the virus H 56, F.T., and Nos. 6 and 7, each 10 mg. of culture derived from the virus H. 57, B.J. These four birds were killed from 3½ to 5 months after injection, and in one only, No. 7, was there no tuberculosis found.

In No. 3 the liver may possibly have been wounded by the needle at the time of injection, for in the margin of the right lobe, opposite what may very well have been the seat of injection, was a small area about ¼ of an inch in diameter, rather paler than the rest of the organ and rather sharply defined by a circle of numerous yellow dots. On section the lesion was found to contain a number of small yellow caseous points. On the surface of the lungs were a small number of dark grey translucent tubercles with opaque centres, very like those often seen in the lungs of calves injected with Group II. viruses, but not calcareous. On section some similar tubercles were seen. The other organs were healthy. A microscopic examination of a scraping from the lesion in the liver showed groups of tubercle bacilli massed together in large numbers. They were very small, and often appeared as granules. A preparation from a tubercle from the lung showed a small number of similar bacilli.

AGuinea-pig, No. 1887, injected intraperitoneally with an emulsion of the lesion in the liver, the dose being necessarily small, was killed after 65 days, and found to have slowly progressing general tuberculosis similar to that seen when small doses of mammalian tubercle bacilli are used.

Cultures sown directly from the fowl failed; but some raised from the Guinea-pig showed the ordinary characters of growth of mammalian tubercle bacilli.

Thus the hypothesis of the lesions in this fowl being spontaneous, and caused by the avian tubercle bacillus is disproved, and there can, I think, be no doubt about the conclusion, namely, that a certain small amount of tuberculosis was caused in this bird by mammalian tubercle bacilli belonging to our human Group II.

Fowl 5 received 15 mg. of the same culture as No. 3 belonging to the strain H 56., F.T., Group II. It was killed 69 days later. There were found a few hard yellow nodules 1 or 2 mm. in diameter attached to the mesentery and three or four little superficial patches on the surface and margins of the liver. The other organs were normal. Tubercle bacilli found both in the yellow spot from the liver, and a nodule from the mesentery; in the latter they were numerous.

Fowl No. 6 received an intraperitoneal injection of 10 mg. of culture derived from the Virus H 57, B.J., Group II. When killed five months later, the intestine and gizzard, together with a large quantity of fat in the mesentery were found to be adherent to the abdominal wall, on the left side, near the seat of inoculation. On the somatic peritoneum in the neighbourhood were a good many slightly raised yellow spots several millimetres in diameter. They looked like fat, but felt firmer, and were shown by the microscope to be cellular, and to contain numerous short tubercle bacilli. The rest of the bird was normal.

Fowl 7, which received a similar injection to No. 6, was killed on the same day and found to be free from tuberculosis.

Young Chickens.

Two only were injected, and those with 10 mg. of culture from the Group I. Virus H 59 L.B., into the peritoneal cavity. Both were found healthy when killed four months later. Thus in three injection and one feeding experiments in fowls, both young and adult, viruses of Group I. had consistently failed to cause any trace of tuberculosis. Eight young chickens (3 weeks old) were fed with 500 mg. of culture from the Group II. virus H 8, S.C. They were killed at intervals varying from three to four and a half months later. All but one were quite healthy; but in No. 8 were found tuberculous lesions more serious than any yet seen in the fowl. On the peritoneal surface of the intestine of this bird was a projecting nodule a quarter of an inch long, having a somewhat constricted base, and on the corresponding part of the mucous surface was a small ulcer surrounded by thickened mucous membrane. On section the nodule was found to contain three little hard dark greenish coloured caseous grains containing numerous tubercle bacilli. A little further on another similar but smaller ulcer was found. The spleen was enlarged and pear shaped, being as thick as it was broad. It contained four or five very well defined hard tubercles of the size of small peas. These shelled out readily, and when crushed were found to be very dense, and to be chiefly composed of firm greenish and rather dry caseous matter, rich in tubercle bacilli. Similar but rather softer tubercles, also rich in bacilli, were found in the liver. The rest of the bird was normal.

This result was of great interest, and it was important to determine with as much certainty as possible whether the tuberculous lesions were caused entirely by the bacilli introduced, and not in part, or altogether due to a spontaneous infection with avian tubercle bacilli. Fortunately avian tubercle bacilli do not affect the guinea-pig severely, and their cultural characters are characteristic. Accordingly cultures were sown from the tubercles both in the liver and spleen, and a guinea-pig was injected with an emulsion from each.

The injection was made into the peritoneal cavity, and the guinea pigs were killed 35 days later. In one, injected with the emulsion from the tubercles in the fowl's liver, there was a small caseous focus at the seat of injection in the abdominal wall, and one in the nearest inguinal gland. There were three little rounded nodules, as big as small peas, in the omentum, containing in their interiors caseous matter like thick cream. The omental and portal lymphatic glands were normal; but the post-sternal glands were slightly enlarged. Liver, spleen, kidneys and lungs, normal. Tubercle bacilli in the lesions were numerous. The other guinea-pig injected with the emulsion of the tubercles from the spleen of the fowl was similar to the above, except that there were no lesions in the abdominal wall, or inguinal glands.

The cultures grown from the tubercles, both from the liver and the spleen of the fowl grew well on glycerin serum. The colonies were notably translucent, and tended to form a confluent growth with a shiny surface.

It is probable therefore that this was a case of spontaneous avian tuberculosis in the fowl, and that the lesions were not due to the human tubercle bacilli with which it was fed.*

Eggs.

Nine fresh eggs were infected with tubercle bacilli, four with a virus of Group I. and five with a virus of Group II. The method of injection was as follows:— The eggs, having been scrubbed with soap and water, were then washed with 2 per cent. lysol, and put in a rack to drain with their broad ends downwards, so that the pole was covered for some considerable time with the drop of lysol which ran down to the lowest point. A small hole, just wide enough to admit a delicate hypodermic needle was then drilled with a sterile trocar in the middle of the broad end of the egg. An emulsion having been made of culture of such a strength that 1 mg. of bacilli was contained in 20 mg. of the fluid, injections were made by means of a special pipette graduated in cubic-millimetres and furnished with a fine hypodermic needle at one end and a small piece of rubber tube at the other. With this apparatus the quantities injected could be regulated accurately. Some eggs received $\frac{1}{2}$ mg., and others 1 mg. of culture contained in 10 and 20 c.mm. of the emulsion respectively. After injection the opening was sealed with collodion. The needle was a little less than 1 in. in length, and as it was pushed for its whole length into the egg the injections were made into the yolk. The results of these injections will be found in detail in the tables. It will be sufficient to mention the principal points here. Of the four eggs injected with a Group I. virus, only one produced a living chick. The chick died immediately after birth. No tuberculosis was found, and no tubercle bacilli, even in the yolk within its body.

In one egg only of the remaining three were any tubercle bacilli found, namely, in No. 4. which was opened after 23 days' incubation. In it was found a dead chick $1\frac{1}{2}$ in. long. Numerous whitish spots were found in the yolk, and these consisted of masses of tubercle bacilli. There were no tubercles in the chick, but tubercle bacilli were found in the contents of its intestine, in the liver, and in the chorion.

From the five eggs inoculated with a culture belonging to Group II., only one, No. 5, produced a living chick at full term. It died immediately afterwards. No tubercles were visible in its organs, but there were little pale spots on the membranes. In the yolk sac within the chick were numerous clumps composed of tubercle bacilli, showing that multiplication had taken place.

Another, No. 4, contained a living chick, when opened on the 22nd day. No tubercles were seen in the chick, and no tubercle bacilli in its liver, yolk, chorion, or blood. In another egg, No. 3, opened on the same day, was found a dead chick, fully developed. A few tubercle bacilli were found in the amnion at a spot corresponding to the point of injection. In Nos. 1 and 2, when opened on the 16th and 17th days respectively were found dead chicks about 1 in. long, already showing feathers. No tubercle bacilli were found in one, and a few in a spot on the chorion in the other.

Summary of the Experiments on Fowls, Chickens, and Eggs.

These experiments have shown, what was indeed well-known, that it is not easy to infect the fowl with tuberculosis by means of mammalian tubercle bacilli. They have, moreover, shown that in exceptional cases it is possible to do so to a very limited extent, by intraperitoneal injection.

The positive results with the fowls were obtained with bacilli of Group II., the common bacillus of human tuberculosis. But the experiments with bacilli of human Group I., which correspond to the bacillus of bovine tuberculosis, were too few to justify the conclusion that the fowl is more susceptible to the kind of tubercle bacillus which has a very low virulence for the ox than it is to that which has a high virulence for that species.

The experiments with eggs add no further information of any value.

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* Since this was written Dr. Griffith has caused acute tuberculosis in the fowl by intraperitoneal injection of this culture in doses of 10· and 1·0 mg.

EXPERIMENTS ON FOWLS.

CULTURES ONLY.

I.—Virus virulent for Bovines.

Virus.	Probable primary seat of disease.	Immediate source of culture.	Mode of infection.	Dose in milligrammes.	Number of Fowl.	Killed or Died.	Duration of life in days.	Result.
H 31. "L.F."	Cervical glands.	Human cervical glands, direct.	Fed.	10 mg.	1	Killed	116	No tuberculosis.
		,, ,,	Intraperitoneal.	10 mg.	2	,,	112	,, ,,

EXPERIMENTS ON CHICKENS.

CULTURES ONLY.

I.—Virus virulent for Bovines.

Virus.	Probable primary seat of disease.	Immediate source of culture.	Mode of infection.	Dose in milligrammes.	Number of Chicken.	Killed or Died.	Duration of life in days.	Result.
H 59. "L.B."	Mesenteric glands.	Human brain, through G.-P. 1860	Intraperitoneal.	10 mg.	9	Killed	116	No tuberculosis.
		,, ,,	Intraperitoneal, and probably partly subcutaneous.	10 mg.	10	,,	116	,, ,,

EXPERIMENTS ON FOWLS

CULTURES ONLY.

II.—Viruses slightly virulent for Bovines.

Virus.	Probable primary seat of disease.	Immediate source of culture.	Mode of infection.	Dose in milligrammes.	Number of Fowl.	Killed or Died.	Duration of life in days.	Result.
H 56. "F.T." -	Lung	Human lung, through G.P. 1682	Intraperitoneal	10 mg.	**3**	Killed	102	Small tubercular lesion in liver, possibly the result of direct inoculation. Some little translucent tubercles in lungs.
		" "	"	15 mg.	**5**	"	69	Tubercle bacilli were found in nodules on the mesentery, and in little necrotic patches in the liver, but there was no true tuberculosis.
		" "	Fed	35 mg.	**4**	"	103	No tuberculosis.
H 57. "B.J." -	Mesenteric glands	Human mesenteric glands, through G.P. 1802	Intraperitoneal	10 mg.	**6**	"	147	Tubercle bacilli found in spots on the peritoneum. No tuberculosis elsewhere.
		" "	"	10 mg.	**7**	"	147	No tuberculosis.

EXPERIMENTS ON CHICKENS.

CULTURES ONLY.

II.—Virus slightly virulent for Bovines.

Virus.	Probable primary seat of disease.	Immediate source of culture.	Mode of infection.	Dose in milligrammes.	Number of Chicken.	Killed or Died.	Duration of life in days.	Result.
H 8. "S.C." -	Mesenteric glands.	Human mesenteric glands, direct	Fed	500 mg. between them (about 60 mg. each)	**1**	Killed	88	No tuberculosis.
		" "	"		**2**	"	99	" "
		" "	"		**3**	"	99	" "
		" "	"		**4**	"	99	" "
		" "	"		**5**	"	133	" "
		" "	"		**6**	"	133	" "
		" "	"		**7**	"	133	" "
		" "	"		**8**	"	133	Two small ulcers in intestine. Four or five pea-sized fibro-caseous tubercles in spleen. Half a dozen similar tubercles in liver. All these lesions contained numerous tubercle bacilli. This was proved to be a spontaneous infection with avian bacilli.

EGG EXPERIMENTS.

EGGS INJECTED WITH CULTURE DERIVED FROM HUMAN CERVICAL GLANDS, VIRUS H 59. "L.B." [VIRULENT FOR BOVINES], ON 7TH APRIL, 1906, AND INCUBATED.

Number of Egg.	Dose of Culture.	Duration of experiment, &c.	Result.
1	0·5 mg.	Opened 22nd April (15 days). Embryo about $\frac{3}{4}$ inch. Dead.	No tubercles. No tubercle bacilli in liver or yolk.
2	0·5 mg.	Opened 23rd April (16 days). Embryo about $1\frac{1}{2}$ inches. Dead.	No tubercles. No tubercle bacilli in liver, yolk, or chorion.
3	1·0 mg.	Born alive, 29th April (22 days). Abdominal wall not quite complete and closed by a transparent membrane. Died a few minutes after birth.	No tubercles. No tubercle bacilli in liver or yolk (green and yellow) within the abdominal cavity of the chick, or in a white patch near the shell membranes (? uric acid). The yolk membranes with a good deal of yolk were found within the abdominal cavity.
4	0·5 mg.	Opened 30th April (23 days). Dead chick, about $1\frac{1}{2}$ inches long.	Numerous whitish spots in the yolk, which proved to be pure cultures of tubercle bacilli in masses. No tubercles were found in the organs of the chick, but tubercle bacilli were found in the contents of the intestine, in the liver, and in the chorion.

EGG EXPERIMENTS.

EGGS INJECTED WITH CULTURE DERIVED FROM HUMAN MESENTERIC GLANDS, VIRUS H 57. "B.J." [SLIGHTLY VIRULENT FOR BOVINES], ON 6TH APRIL, 1906, AND INCUBATED.

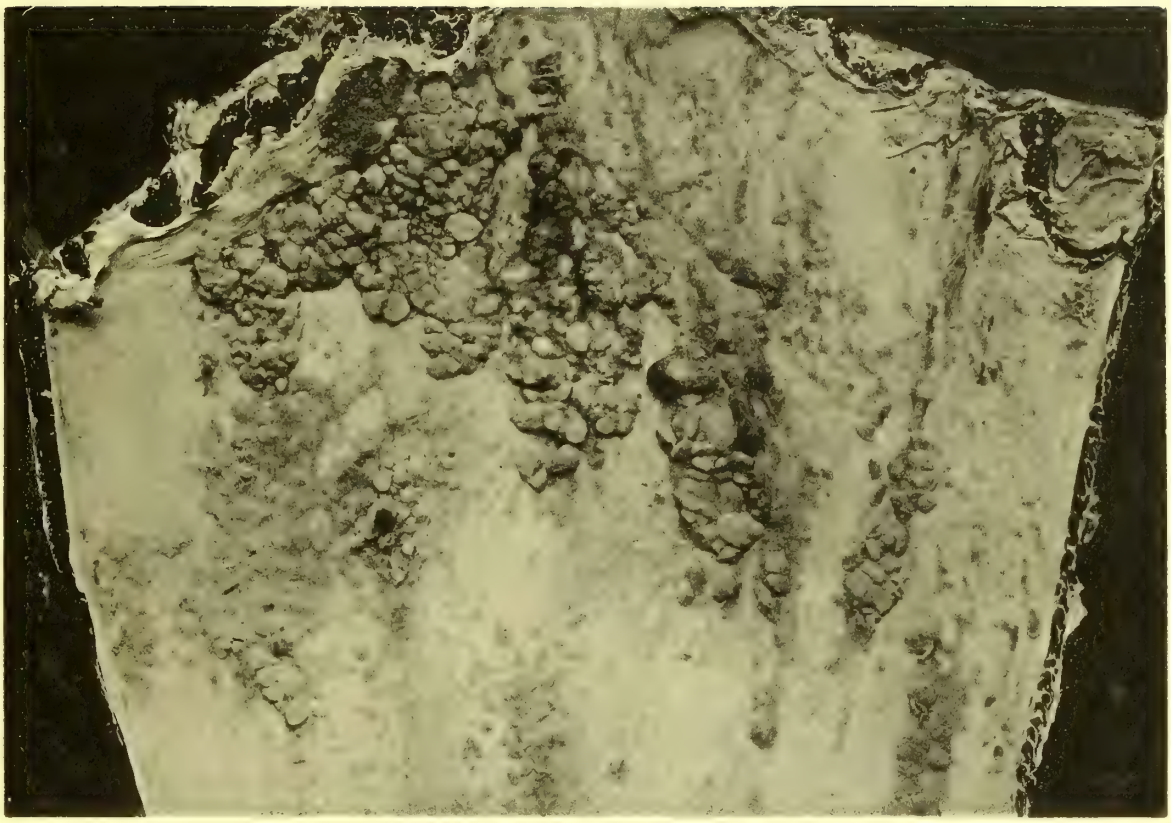
Number of Egg.	Dose of Culture.	Duration of experiment, etc.	Result.
1	1·0 mg.	Opened 22nd April (16 days). Embryo about 1 inch long, dead. Few early feathers.	No tubercles. No tubercle bacilli in liver or yolk.
2	1·0 mg.	Opened 23rd April (17 days). Embryo 1 inch long, dead. Feathers.	No tubercles. No tubercle bacilli in liver or yolk. Two tubercle bacilli seen in a preparation from a spot in the chorion.
3	1·0 mg.	Opened 28th April (22 days). Living chick, fully developed.	No tubercles. No tubercle bacilli in liver, yolk, chorion, or blood.
4	1·0 mg.	Opened 28th April (22 days). Dead chicken, fully developed.	No tubercles. No tubercle bacilli in liver, yolk, chorion, or intestines. There were a few tubercle bacilli in the amnion at a point corresponding to the point of injection.
5	0·5 mg.	Born alive, 29th April (23 days). Abdominal wall not quite complete, and closed with a transparent membrane.	No tubercles visible in organs, but little pale spots were seen on the yolk membranes. The yolk within the abdominal cavity was full of clumps of tubercle bacilli, indicating culture, *i.e.*, multiplication. No tubercle bacilli in liver.

THE RELATIVE SUSCEPTIBILITY OF DIFFERENT SPECIES OF ANIMALS TO TUBERCLE BACILLI OF HUMAN AND BOVINE ORIGIN, AS SHOWN BY THE RESULT OF EXPERIMENTAL INFECTIONS.

Species of Animal.	Result of infecting (intravenous injection excluded) with :		
	(i.) Viruses of Bovine Origin.	(ii.) Viruses of Human Group I.	(iii.) Viruses of Human Group II.
Ox	Rapidly fatal tuberculosis with large doses. Minimal retrogressive lesions with small doses. With intermediate doses disease of any intermediate degree of severity. Great differences in susceptibility in different individuals.	Same results as with viruses of bovine origin.	Softening caseous tumour at the seat of injection. Nearest lymphatic glands affected. Minimal retrogressive metastatic lesions in about one half. Never fatal unless injection intravenous.
Goat	Rapidly fatal tuberculosis with large doses. Less severe disease with smaller doses.	Same results as with viruses of bovine origin.	Same results as above.
Pig	General tuberculosis, readily set up both by subcutaneous inoculation and by feeding, usually fatal in the young pig, but with small doses, and in the adult, tendency to retrogression exhibited.	Same results as with viruses of bovine origin in the young pig, but no experiments with adults. Tubercle bacilli found in the lesions are but few, and it is remarkable how extensive may be the disease found in pigs which look well and fat.	Same results as above, but local lesion not so large, and little retrogressive tubercles in the lungs commoner than in the calf.
Monkey [Rhesus]	General tuberculosis, more or less rapidly fatal, according to dose.	Same result as with viruses of bovine origin.	General tuberculosis, not quite so rapidly fatal as with viruses of Human Group I.
Baboon	As in the Rhesus.	No animals.	General tuberculosis.
Chimpanzee	General tuberculosis, readily set up by subcutaneous injection and feeding. One fed with 10 million bacilli lived for 144 days, and died of broncho-pneumonia. No tuberculous lesions were found beyond the mesenteric and ileo-colic glands.	One animal, subcutaneously injected with 1·0 mg. of bacilli, died of general tuberculosis in 79 days.	Fatal general tuberculosis set up by feeding and subcutaneous injection (two animals only). One fed with 1 mg. of bacilli died of general tuberculosis after 77 days. One subcutaneously injected with the same dose died of general tuberculosis in 50 days.
Rabbit	Infection invariably followed by general progressive tuberculosis.	Same results as with viruses of bovine origin.	Disseminated retrogressive tuberculosis after intraperitoneal injection. Animal remains well as a rule, rarely dies early if dose be large; more rarely still chronic progressive tuberculosis is set up.
Guinea-pig	Infection invariably followed by general progressive tuberculosis.	Same results as with viruses of bovine origin.	General tuberculosis, fatal, not quite so rapidly as with viruses of Human Group I.
Dog	Very resistant to subcutaneous inoculation and feeding. Fatal tuberculosis after intraperitoneal inoculation in sufficient dose.	General tuberculosis has been set up both by feeding and subcutaneous injection, usually retrogressive and not severe. Fatal general tuberculosis occurred in one dog injected intraperitoneally with 10 million bacilli.	One dog injected into the peritoneum with 10 milligrammes of bacilli, died of general tuberculosis. One fed with 10 milligrammes died of tuberculosis of lung in 94 days. Others which received smaller doses had a minimal amount of disease.

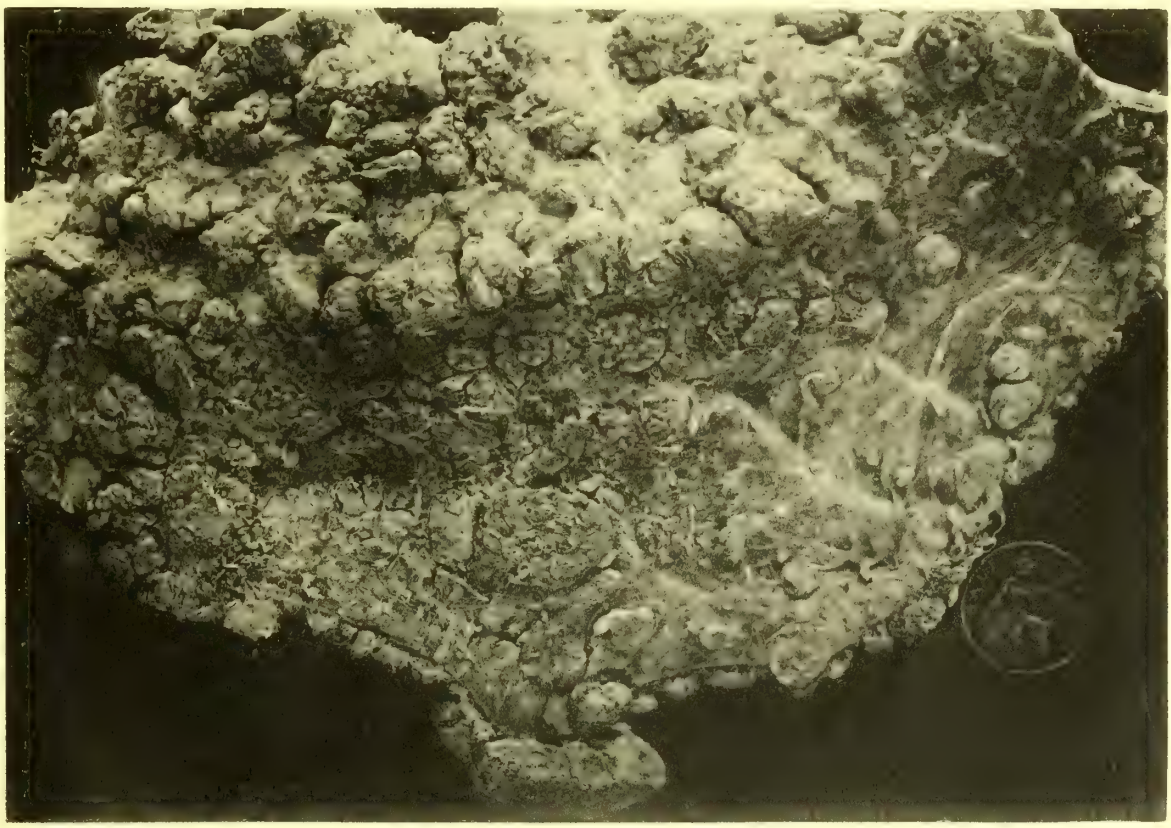
Species of Animal.	Result of infecting (intravenous injection excluded) with :		
	(i) Viruses of Bovine Origin.	(ii) Viruses of Human Group I.	(iii) Viruses of Human Group II.
Cat - - - -	General tuberculosis readily set up by subcutaneous and intraperitoneal inoculations, not so readily by feeding ; kittens are much more susceptible than cats.	Chronic tuberculosis set up in three cats by feeding.	Minimal lesions after intraperitoneal injection (one cat). No tuberculosis after feeding with large dose (one cat).
Rat - - -	Apparently insusceptible to subcutaneous injection or feeding. Fatal tuberculosis after intraperitoneal inoculation with adequate doses.	No tuberculosis was set up in a few rats subcutaneously injected. After feeding with tuberculous material, tubercle bacilli were sometimes found in the apparently healthy mesenteric or submaxillary lymphatic glands. In two instances a few minute tubercles were found in the lungs. Slowly progressing fatal tuberculosis, characterized by typical and relatively trivial lesions and enormous numbers of bacilli, after intraperitoneal injection of large doses.	The same as with Human Group I., but disease even less rapid in progress.
Mouse - -	Resembles the rat, but is perhaps more susceptible.	Somewhat similar to rat.	
Fowl - - -	Local lesion only after subcutaneous inoculation ; no lesions produced by feeding ; miliary tuberculosis of the lung in one case after intravenous inoculation.	Nil.	A few fibrous tubercles may occasionally be produced by intraperitoneal injection.

A. S. G.
L. C.



HEIFER 245. Subcutaneous. Virus H. 16. "J. H".

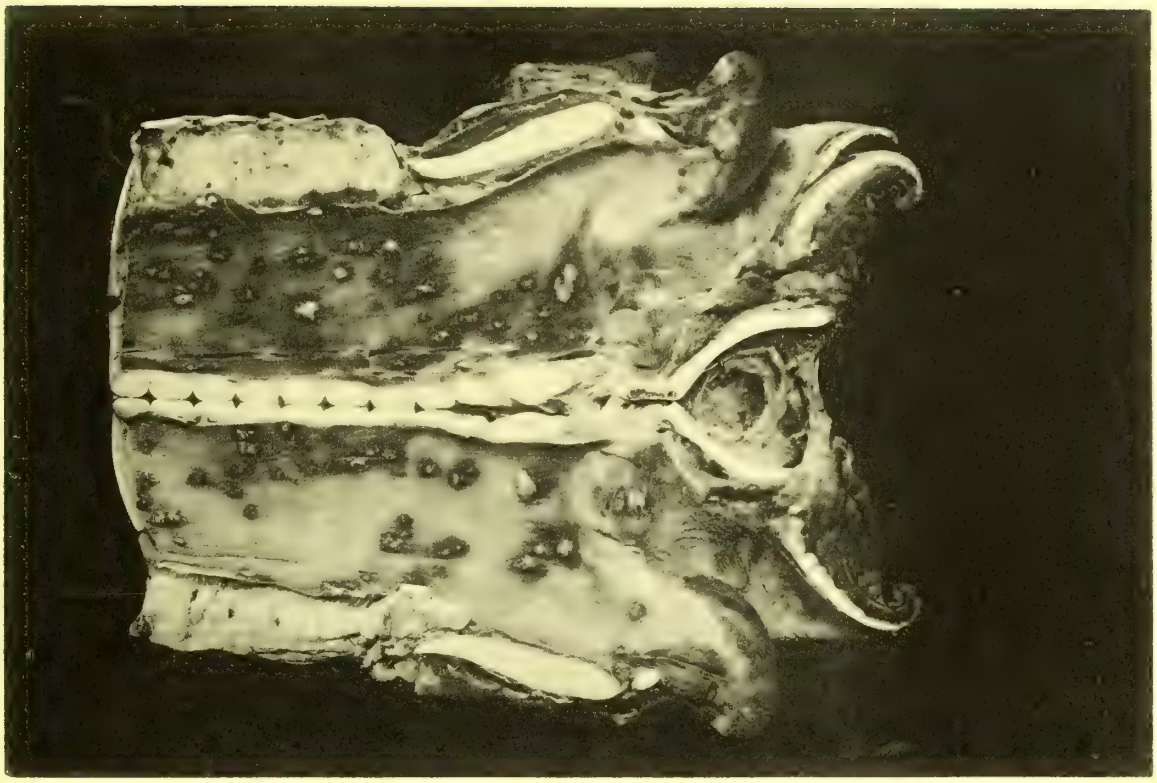
Costal pleura, showing "Perlsucht" growths.



HEIFER 245. Subcutaneous. Virus H. 16. "J. H".

Lobe of Lung, showing "Perlsucht" growths on the surface, and in the marginal fringes.

Plate 2.



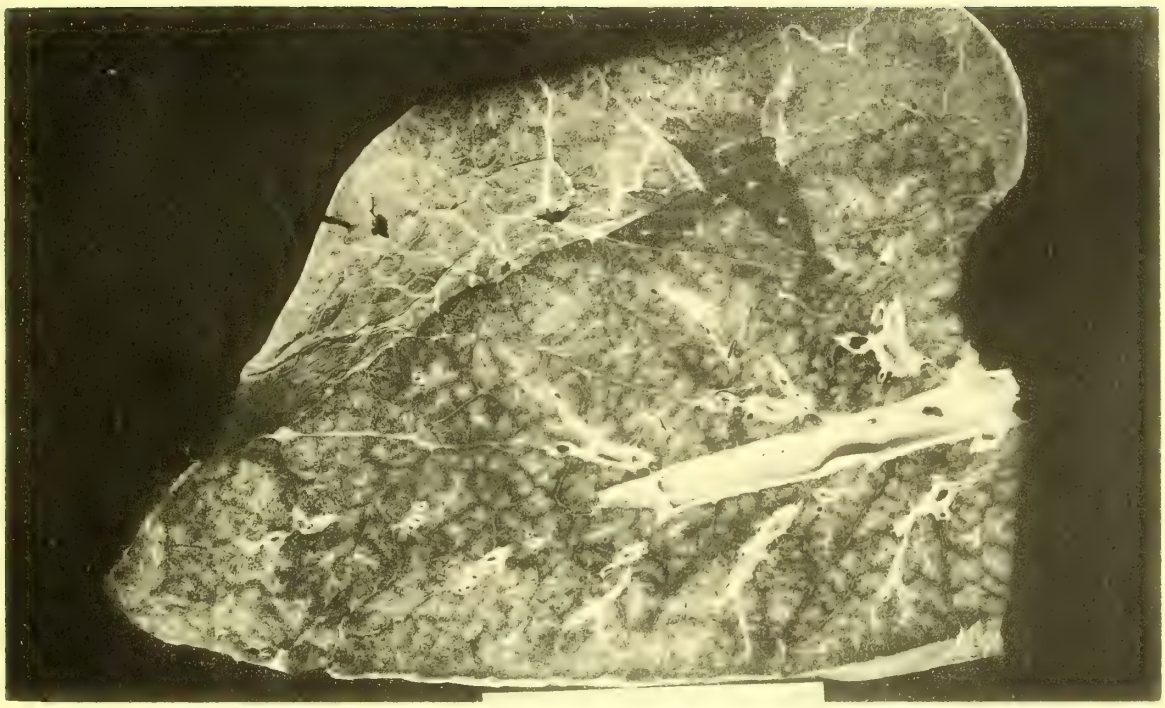
CALF 545. Subcutaneous. Virus H. 14. "F. S."

Longitudinal section of larynx and trachea, showing caseous nodules in the mucous membrance

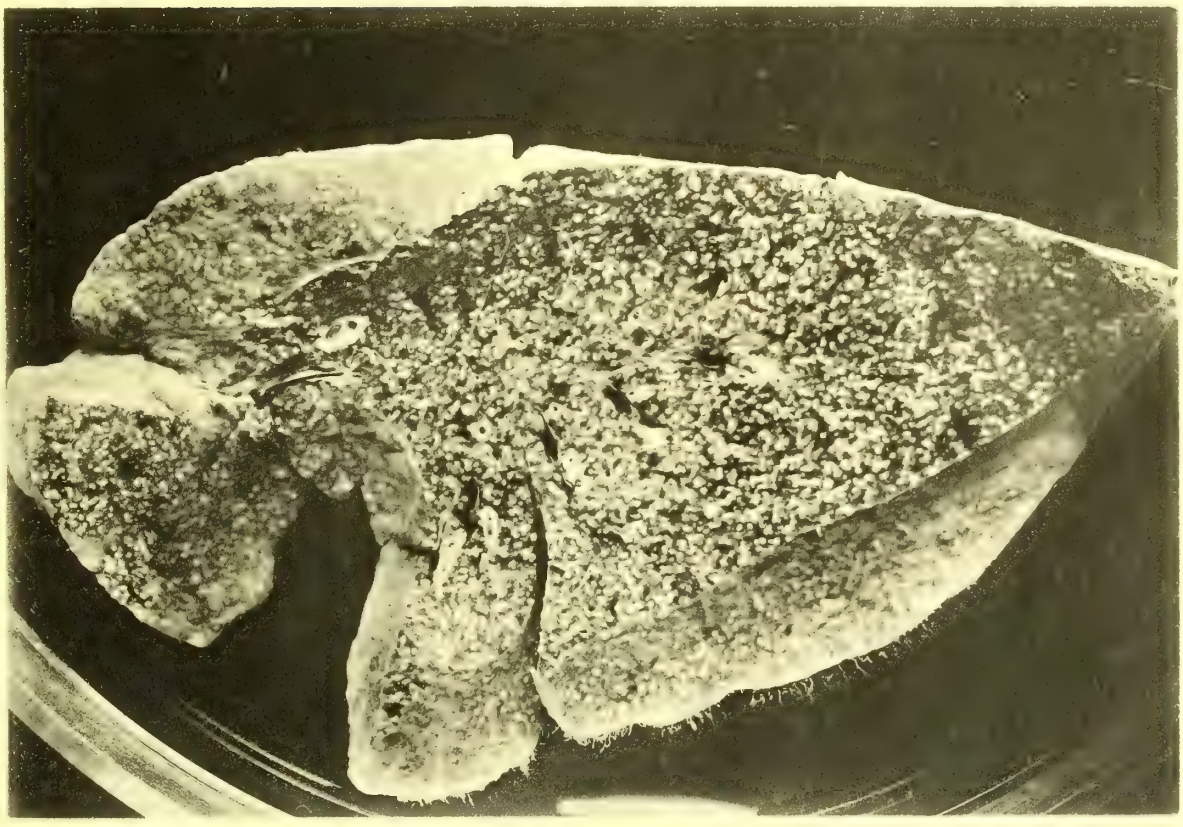


CALF 491. Subcutaneous. Virus H. 31. "L. F."

Diaphragmatic pleura, showing nodular outgrowths.



CALF 539. Intravenous. Virus H. 17. "Sp. B."
Cut surface of posterior lobe of left Lung.



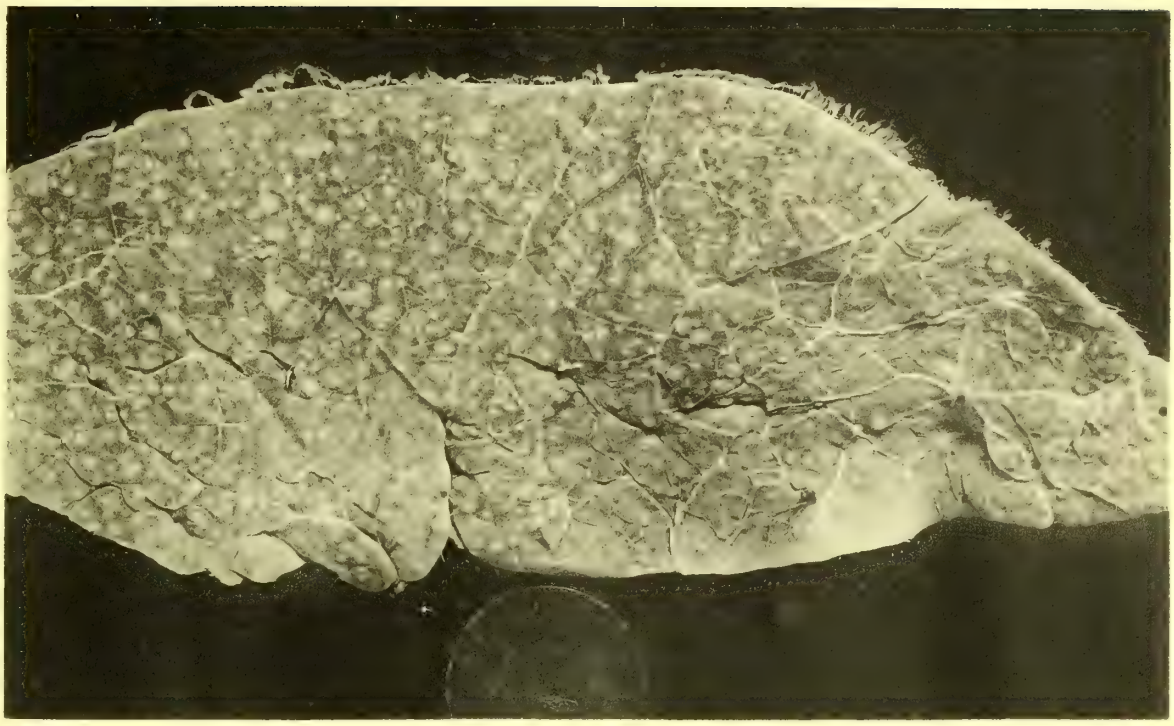
GOAT. 3. Subcutaneous. Virus H. 10. "B. S."
Cut surface of left Lung.



CALF 191. Subcutaneous. Virus H. 10. "B. S."
Anterior lobe of Lung.



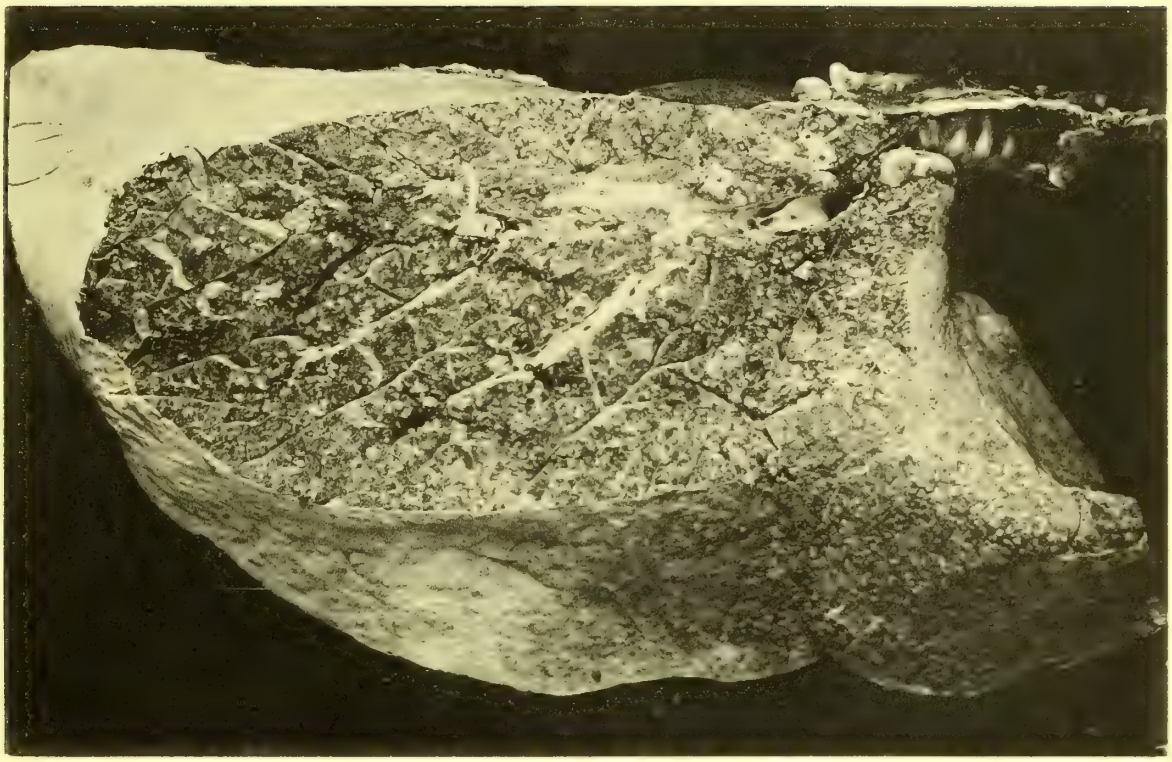
HEIFER 249. Subcutaneous. Virus H. 10. "B. S".
Anterior lobes of right Lung.



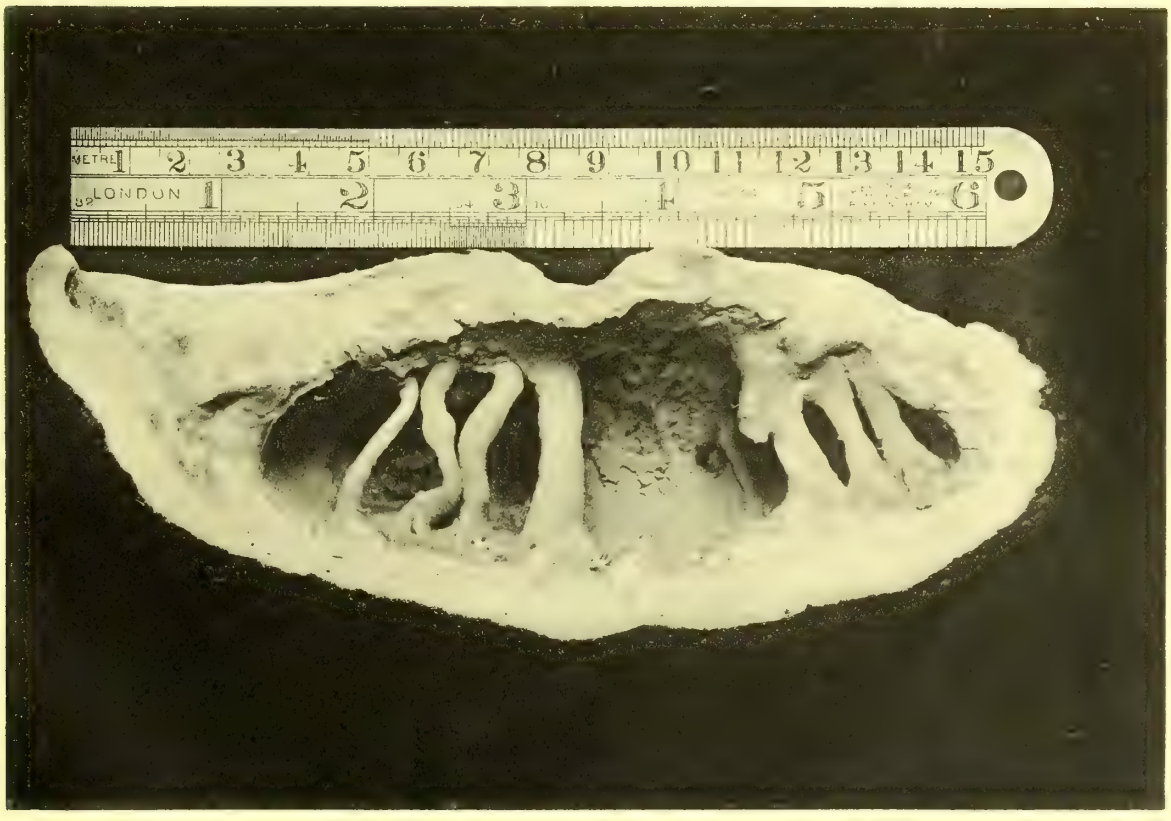
CALF 515. Subcutaneous. Virus H."28."C. L".
Anterior lobe of Lung.



CALF 403. Subcutaneous. Virus H.20."F. L".
Cut surface of Lung.

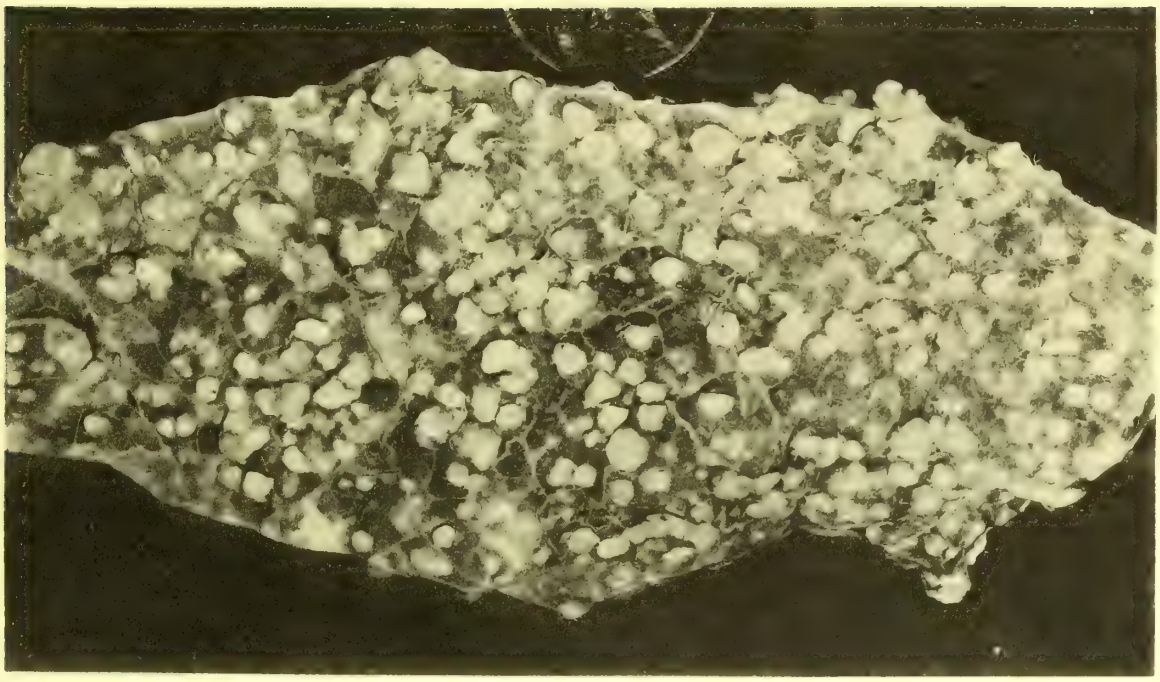


CALF 361. Intravenous. Virus H.8. "S.C."
Right Lung.



CALF 175. Subcutaneous. Virus H.8. "S.C."
Section of tumour at seat of inoculation

Plate 7.



CALF 343. Subcutaneous. Virus H. 16. "J. H."

Anterior lobe of lung.

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* Denotes Feeding Experiment.

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411	564	545	324	675	614
413	345	547	507	677	615
415	540	549	377	679	432
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421	565	555	425	685	450
423	178	557	423	687	750
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431	561	563	149	697	662
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435	464	569	79	701	802
437	600	571	429	703	803
439	539	573	379	705	808
441	559	575	81	707	797
443	255	577	482	711	388
447	523	579	735	713	791
449	582	581	736	719	256
453	465	583	446	721	584
457	541	585	742	723	257
461	601	587	716	727	585
463	659	589	718	729	390
465	714	591	749	731	809
467	583	593	679	733	199
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765	296	887	771	1057	951
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769	816	891	434	1065	931
771	347	893	326	1069	981
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